

SEPTEMBER 1999
VOLUME 41
NUMBER 9



STORM DATA

AND UNUSUAL WEATHER PHENOMENA
WITH LATE REPORTS AND CORRECTIONS



noaa

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION

NATIONAL ENVIRONMENTAL SATELLITE,
DATA AND INFORMATION SERVICE

NATIONAL CLIMATIC DATA CENTER
ASHEVILLE, NC

Cover: The remnants of the St. James street bridge in Tarboro, NC. Hurricane Floyd dropped 10-20 inches of rain in the already saturated eastern North Carolina coastal areas. Devastating floods caused nearly \$1 Billion in property damage. (Photograph courtesy of Dave Gately, Federal Emergency Management Agency, Washington, DC)

TABLE OF CONTENTS

	Page
Outstanding Storms of the Month	4
Storm Data and Unusual Weather Phenomena	7
Additions/ Corrections	149
Reference Notes	154

STORM DATA

(ISSN 0039-1972)

National Climatic Data Center

Editor: Stephen Del Greco

Assistant Editor: Stuart Hinson

STORM DATA is prepared, and distributed by the National Climatic Data Center (NCDC), National Environmental Satellite, Data and Information Service (NESDIS), National Oceanic and Atmospheric Administration (NOAA).

The Storm Data and Unusual Weather Phenomena narratives and Hurricane/Tropical Storm summaries are prepared by the National Weather Service. Monthly and annual statistics and summaries of tornado and lightning events resulting in deaths, injuries, and damage are compiled by the National Climatic Data Center and the National Weather Service's (NWS) Storm Prediction Center.

STORM DATA contains all confirmed information on storms available to our staff at the time of publication. Late reports and corrections will be printed in each edition.

Except for limited editing to correct grammatical errors, the data in **Storm Data** are published as received.

Note: "None Reported" means that no severe weather occurred and "Not Received" means that no reports were received for this region at the time of printing.

Subscription, pricing, and ordering information is available from:

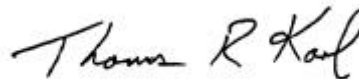
National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801
(828) 271-4800 or (828) CLIMATE

The editors of **STORM DATA** solicit your help in acquiring photographs (prints or slides; black and white, or color), maps, clippings, etc. of significant or severe weather events (past or present) for use in the "Outstanding Storms of the Month" section of **STORM DATA**. We request our subscribers or other interested persons to mail such items to:

Storm Data
National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801

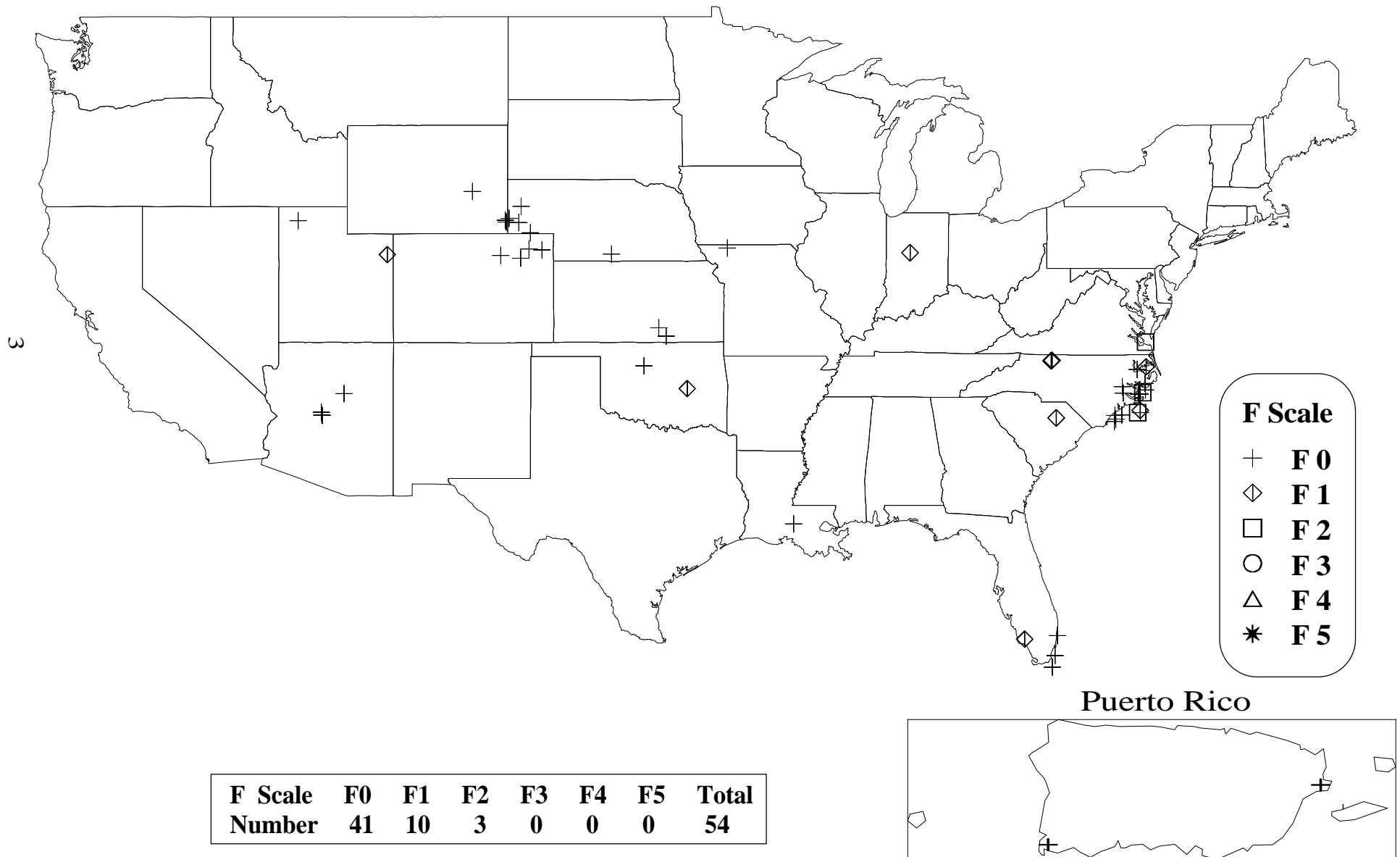
Any such items received by the editor will be for use in **STORM DATA** only. Any other use will be with the permission of the owner of said items. Materials will be returned if requested.

This is an official publication of the National Oceanic and Atmospheric Administration and is compiled from information received at the National Climatic Data Center Asheville, North Carolina 28801-2733.



Thomas R. Karl
Director,
National Climatic Data Center

September 1999 Confirmed Tornadoes



OUTSTANDING STORMS OF THE MONTH

1) HURRICANE FLOYD DEVASTATES THE US EAST COAST

Hurricanes Floyd and Dennis saturated the U.S. East Coast in late August and early September. Hurricane Dennis moved up the east coast in late August, lingered off the coast of North Carolina, then made landfall on September 4. Extremely heavy rainfall caused extensive flooding. Two weeks later, on September 16, Hurricane Floyd made landfall near Cape Fear, North Carolina, bringing excessive amounts of rainfall to the already saturated area. As much as 10 - 20 inches of rain fell along the eastern seaboard, with 19.06 inches falling at the airport in Wilmington, NC and 16.06 inches falling in Myrtle Beach, SC. Several hundred thousand people evacuated coastal areas of Florida, Georgia, South Carolina and North Carolina. A wind gust up to 120 knots (138 mph) was reported at Wrightsville Beach, NC. Flash Floods and River Floods from Hurricane Floyd contributed to 40 fatalities, \$1 Billion in property damage and over \$150 Million in crop damage. Several deaths occurred when occupants of vehicles that became stranded in moving water, attempted to make it back to dry land. Hurricane-force wind, storm surge and river flooding caused most of the damage to residential homes, commercial structures and thousands of acres of crops. Rough surf caused beach erosion along the entire east coast. Severe flooding and extensive damage also occurred in Virginia, Maryland, Delaware, Pennsylvania, New Jersey and New York. Several thousand people went without electric power for up to a week, while gas and water service was disrupted for many areas of central and northern New Jersey.

Below Left: A sign encouraging residents of Kure Beach NC to evacuate the coast in anticipation of Hurricane Floyd. The largest peace-time evacuation in the United States took place as residents of Florida, Georgia, South Carolina, North Carolina and Virginia headed away from the coast.

(Photograph courtesy of Dave Gately, Federal Emergency Management Agency)

Below Right: Beach erosion is commonplace after the passage of Hurricane Floyd. Pounding surf and a 10-12 foot storm surge resulted in severe damage to residential and commercial structures along the eastern seaboard.

(Photograph courtesy of Dave Saville, Federal Emergency Management Agency)





Above: More beach erosion and house damage in Oak Island, NC.

(Photograph courtesy of Dave Gately, Federal Emergency Management Agency)



Above: This home is located along the Tar River in Pactolus, NC.

(Photograph courtesy of Dave Gately, Federal Emergency Management Agency)



Above: This home has been inundated by the flooded Tar River. Several communities located in low-lying regions near riverbanks were flooded. This home in Pactolus, NC, can only be reached by boat.

(Photograph courtesy of Dave Gately, Federal Emergency Management Agency)



Above: A search and rescue team brings in several stranded dogs from flooded Princeville, North Carolina.

(Photograph courtesy of Dave Saville, Federal Emergency Management Agency)



Above: This power substation is surrounded by water from the flooded Tar River. Utility companies have managed to route power around this facility and the main facility.

(Photograph courtesy of Dave Gately, Federal Emergency Management Agency)



Above: An aerial view of a neighborhood in Greenville, North Carolina. The Tar River exceeded its banks and flowed into this community. The Tar River crested at 29.74 feet in Greenville, NC, 16 feet over flood stage.

(Photograph courtesy of Dave Gately, Federal Emergency Management Agency)



Above: Heavy equipment operators remove tons of debris from the business district in Franklin, Virginia.

(Photograph courtesy of Liz Roll, Federal Emergency Management Agency)



Above: Heavy equipment is needed to remove tons of debris in Boundbrook, NJ where the Raritan River flooded. Two fatalities occurred when they refused to evacuate.

(Photograph courtesy of Andrea Booher, Federal Emergency Management Agency)

Storm Data and Unusual Weather Phenomena

September 1999

September 1999										
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
<u>ALABAMA, North Central</u>										
ALZ014	Winston									
	04	1615CST			0	0	2K	0		High Wind (G45)
	What was reported as a large dust devil knocked out the wall of a chicken house and folded the roof back. Several other dust devils were reported throughout northern Alabama this afternoon.									
ALZ006	Madison									
	05	1600CST			0	0	0	0		Excessive Heat
	A new record high temperature of 101 degrees was observed at the Huntsville International Airport.									
Lamar County 4 SW Vernon	05	1657CST			0	0	10K	0		Thunderstorm Wind (G55)
	A roof was blown off a house and several trees were knocked down. This damage occurred just southwest of Vernon on CR 9.									
ALZ041	Autauga									
	06	1444CST			0	0	2K	0		High Wind (G45)
	Gusty wind knocked over several outside shed buildings near Prattville. The storms also produced half inch diameter hail.									
ALZ006	Madison									
	06	1600CST			0	0	0	0		Excessive Heat
	The afternoon high temperature of 100 degrees at the Huntsville International Airport tied the record for this date.									
ALZ016	Cullman									
	08	1240CST			0	0	2K	0		High Wind (G45)
	Gusty wind caused minor damage to a mobile home roof and turned over a few out buildings. This damage occurred just west of SR 31 near the Morgan County border.									
Lawrence County Hillsboro	08	1300CST			0	0	3K	0		Thunderstorm Wind (G50)
	Power lines were blown down in Hillsboro.									
Lawrence County Moulton	08	1300CST			0	0	10K	0		Thunderstorm Wind (G55)
	Roofs were torn off three buildings in the city of Moulton.									
Winston County Delmar	08	1515CST			0	0	1K	0		Thunderstorm Wind (G50)
	Trees were blown down in Delmar.									
ALZ006	Madison									
	08	1600CST			0	0	0	0		Excessive Heat
	The afternoon high temperature of 97 degrees at the Huntsville International Airport tied the record for this date.									
Lee County Loachapoka	08	1755CST			0	0	1K	0		Thunderstorm Wind (G50)
	Trees were knocked down and pea sized hail was reported in Loachapoka.									
ALZ006	Madison									
	17	0600CST			0	0	0	0		Extreme Cold
	The early morning low temperature of 47 degrees at the Huntsville International Airport tied the record for this date.									
ALZ024	Jefferson									
	17	0600CST			0	0	0	0		Extreme Cold
	A new record low temperature of 49 degrees was measured at the Birmingham International Airport.									
ALZ044	Montgomery									
	17	0600CST			0	0	0	0		Extreme Cold
	The early morning low temperature of 52 degrees at Dannelly Field tied the record for this date.									
Winston County 4 N Double Spgs	20	1952CST			0	0	25K	0		Thunderstorm Wind (G60)
	One mobile home was totally destroyed and several trees were blown down near Rock Creek.									
Cullman County Crane Hill	20	2013CST			0	0	15K	0		Thunderstorm Wind (G60)
	One mobile home was blown over and several trees and power lines were knocked down near Crane Hill.									
ALZ024	Jefferson									
	23	0600CST			0	0	0	0		Extreme Cold
	A new record low temperature of 42 degrees was measured at the Birmingham International Airport this morning.									
ALZ044	Montgomery									
	23	0600CST			0	0	0	0		Extreme Cold
	A new record low temperature of 52 degrees was measured at Dannelly Field this morning.									

ALABAMA, Southeast

NONE REPORTED.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

ALABAMA, Southwest

Baldwin County

Gulf Shrs

19 0830CST

1

1

Rip Currents

Two persons from out of state were swimming in rough water near Gulf Shores. They both struggled in the surf and bystanders were able to get to one of the swimmers out of the rough water but could not get the other one. He was not found until the next day. Red Flag Warnings were flying along the beaches due to rough surf.

M29IW

Mobile County

Dauphin Is

20 0400CST

0

0

5K

Coastal Flooding

21 0700CST

Higher than normal tides, caused by Tropical Storm Harvey located in the Gulf of Mexico, caused street flooding on Dauphin Island. High water was reported across County Road 2 and streets crossing the highway generally west of St Andrews. No flooding was reported in homes but Bienville Blvd. had standing water in it for more than a day. Some vehicles had to be towed out of the street. A cold front moved through on the morning of the 21st and winds became more northerly and the tides subsided.

ALASKA, Northern

AKZ007

Tanana Valley

17 1746AST

0

0

High Wind (G53)

18 1153AST

The occluded front from a strong system over Bristol Bay moved north over the Interior of Alaska bringing strong winds to Alaska Range Passes. Strongest winds were:

Healy: sustained 35 mph, gust 61 mph

Delta Junction: sustained 40 mph, gust 54 mph

In addition, a cooperative observer near Delta Junction (Whitestone Farms) reported "damaging winds" - no speed estimate.

AKZ001

Arctic Slope Coastal

24 0535AST

0

0

High Wind (G47)

1100AST

A low pressure center moving north over eastern Alaska reformed over the eastern Arctic coast and then deepened as it continued east along the Canadian Arctic coast. Winds in excess of 50 mph were confined to the area east of Flaxman Island. Strongest wind at Barter Island was 45 mph sustained, gust 54 mph.

AKZ007

Tanana Valley

26 0300AST

0

0

Heavy Snow

1200AST

A warm front moving east across the Interior of Alaska produced heavy snow over the western Tanana Valley. Snow at Lower elevations turned to rain by noon melting much or all of the accumulation on the valley floor. Reports from Cooperative Observers:

Denali Park: 13 inches

Keystone Ridge: 6.6 inches

Ester Dome: 10.5 inches

Two Rivers: 6 inches.

AKZ006

Southern Seward Peninsula-Eastern Norton Sound

30 0657AST

0

0

Ice Storm

1054AST

An occluded front moved over southern Norton Sound on the 30th, eventually dissipating near the Seward Peninsula that evening. Unalakleet reported Freezing Rain on NWS observations during this time, and a telephone conversation with a resident at Golovin around 1500 confirmed freezing rain had fallen earlier in the day.

ALASKA, Southeast

AKZ022

Cape Fairweather To Cape Suckling-Coastal Area

16 1000AST

0

0

High Wind (G60)

2000AST

Avery strong low in the Northern Gulf of Alaska brought strong winds to the Eastern coast with the passage of the associated occlusion. Cape yakataga winds 50 to 60kt.

AKZ022>026

Cape Fairweather To Cape Suckling-Coastal Area - Cape Decision To Cape Fairweather-Coastal Area - Lynn Canal-Glacier Bay - Juneau Borough-Admiralty Island-Icy Strait Area - Frederick Sound-Kupreanof-Wrangell Islands To Ernest South

21 2100AST

0

0

High Wind (G56)

22 1800AST

A 949mb bomb in the Southern Gulf of Alaska caused a major wind and rain event across the entire Panhandle. Peak winds included 58kt in Yakutat, 52kt at Kake, 52kt at Cape Spencer, 54kt at Cape Decision, 58kt at Ketchikan, 53kt at Annette Island, 56kt at Skagway, 77kt at Hydaberg, and 52kt at Juneau Federal Building.

AKZ027>028

Southern Southeast Alaska Ernest Sound To Dixon Entrance - Dixon Entrance To Cape Decision-Coastal Area

21 2100AST

0

0

High Wind (G77)

22 1800AST

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

ALASKA, Southern

AKZ016

Bristol Bay Coastal

**10 0900AST
2200AST**

0

0

High Wind (G53)

A moderate front, moving northwest through the Gulf of Alaska weakened rapidly Friday night in an arc through the Barren Islands and Shelikof Strait. Northerly wind gusts reached 61 mph just south of King Salmon at Naknek briefly Friday afternoon.

Cook Inlet

60 E Anchorage

**13 0700AST
1300AST**

0

0

5K

Heavy Rain

Heavy rains around Girdwood and in Portage Valley prompted a Flash Flood Watch for small streams. Over 2 inches of rain was recorded in 12 hours around Girdwood, with much higher amounts around Portage. Minor flooding was reported just off the road to Portage.

Additionally, gusty winds were reported offshore in areas of Prince William Sound adjacent to the Gulf of Alaska.

Cook Inlet

**25 E Soldotna to
25 E Kenai**

**13 0930AST
14 0740AST**

0

0

1K

Flood

Heavy rains Sunday night and Monday morning contributed to rapid rises on the Snow River, the Trail River and other streams draining into Kenai Lake. Local urban-type flooding around Primrose Road was reported, however this only affected a small area around the campground.

AKZ017

Central Gulf Coast

**14 0000AST
1500AST**

0

0

High Wind (G53)

A vigorous front stalled out just south of Prince William Sound Tuesday morning, weakening rapidly Tuesday afternoon. Brisk east winds in advance of the front gusted to 61 mph at Middleton Island. Brisk east winds were also reported in the southeastern corner of Prince William Sound and across waters adjacent to the southeast coast of the Kenai Peninsula.

AKZ016>017

Bristol Bay Coastal - Central Gulf Coast

**16 1100AST
17 0300AST**

0

0

High Wind (G55)

A complex frontal system, approaching Kodiak Island and already into the Upper part of the Alaska Peninsula Thursday afternoon, was preceded by brisk easterly winds in much of the Bristol Bay zone. On Thursday, gusts reached 61 mph at King Salmon at 4:52 pm and 63 mph at Iliamna at 6:53 pm.

Winds began to diminish after dark.

Wind gusts reached 61 mph at Middleton Island in advance of the front Thursday and early Friday.

The front drifted north and began to dissipate Friday morning as another low intensified southeast of the Alaska Peninsula.

Central Gulf Coast

Seward

17 0000AST

0

0

5K

Heavy Rain

AKZ013>015-017>018

Susitna Valley - Copper River Basin - Cook Inlet - Central Gulf Coast - Kodiak Island-Eastern Alaska Peninsula

**17 0330AST
18 1000AST**

0

0

300K

High Wind (G97)

An intense 965 mb low just east of Chignik Friday morning, curved north northwest through Bristol Bay to near Togiak by late Friday night. The low drifted slowly northwest and began to weaken thereafter. Brisk southeast winds were reported along the east and south quadrant of the low.

A moderate front, associated with the low, extended from the southeast corner of Bristol Bay to just north of Kodiak late Friday morning. By late Friday night, the front extended in a long arc from the southwest mainland into the Tanana Valley to just east of Yakutat. Brisk east winds preceded the front across the Central North Gulf Coast, the Kenai Peninsula, Prince William Sound and the adjacent offshore waters.

In zone 18...

Kodiak recorded ASOS adjusted wind gusts of 61 mph at 5:53 pm Friday on the southeast side of the low. Heavy rains were also reported around the Island.

Across zone 17...

In advance of the front, wind gusts at Middleton Island peaked at an ASOS adjusted 78 mph at 8:15 am Friday, a few hours prior to frontal passage.

At Whittier, wind gusts reached 63 mph and caused close to \$50,000.00 damage to boats in the harbor, several harbor structures and to vessels tied up in the area but outside of the harbor.

A flash flood watch was posted for Seward at 7:30 am Saturday, changed to a watch at 2pm Saturday, then cancelled at 4pm Saturday due to the heavy rains. Brisk north winds prompted a wind advisory in Seward at 11 am Friday. Peak winds Saturday morning

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

ALASKA, Southern

between midnight and 1 am reached an ASOS adjusted 56 mph. A post-frontal thunderstorm dumped .5 inches of rain at the Resurrection and Glacier Creeks...in one hour! As reported by the Peninsula Clarion in a front page article, up to 6.5 inches of rain fell from Thursday through Sunday at Grouse Creek, eight miles up the Seward Highway from Seward. Three houses around the Meridian Creek watershed had slight damage from water in crawl spaces. Much damage was averted due to the recent \$250,000.00 debris removal from the Resurrection River channel. Other creeks, including Lowell Creek, ran at bankfull.

Strong winds were reported in Cordova. Peak winds of 64 mph were recorded at the Boat Harbor at 6:25 am Saturday. An ASOS adjusted 62 mph gust was recorded as the highest wind at the Cordova airport between 10 and 11 am Friday. Wind advisories were posted for Cordova as early as 9:05 pm Thursday. Heavy rains in the area also caused flooding and erosion problems. An overflowing culvert flooded the road along Eyak Lake. Floods were also reported along the Copper River Highway. An inch of water was also reported in the mailbox area of the Post Office.

In zone 15...a high wind watch was posted for East Anchorage and Turnagain Arm at 4:30 am Friday, then upgraded to a high wind warning at 10:40 am Friday. Peak winds recorded from a Davis weather system in Bear Valley reached 112 mph on Black Bear Road. Wind gusts ranging from 65 to 99 mph were reported around Turnagain Arm and much of east Anchorage and higher elevations of Eagle River (Skyline Drive at about 1400 ft). A picture of a 'missing' house on Baldy Mountain was shown in Saturday's Anchorage Daily News. Wind gusts from 30 to 50 mph were reported in the Kenai/Soldotna area around Homer and across adjacent areas of Cook Inlet.

In zone 13...brisk easterly winds also prompted a wind advisory at 4:30 am Friday. Peak adjusted ASOS/AWOS winds reached 56 mph at both Palmer (10 - 11pm Friday) and Wasilla (3pm - 5 pm Friday).

AKZ015-017>018

Cook Inlet - Central Gulf Coast - Kodiak Island-Eastern Alaska Peninsula

21	1800AST	0	0	5K	High Wind (G79)
22	2100AST				

A very strong front moving toward the Northern Gulf Coast was preceded by strong easterly winds.

In advance of the front, wind gusts at Middleton Island peaked at an ASOS adjusted 91 mph at 8:15 am Friday, a few hours prior to frontal passage. Apparently the NOAA ship "Rainier" was to deploy a fixed buoy 46061 at Hinchinbrook Entrance to Prince William Sound, but got word of the storm and hid out in sheltered areas around Hinchinbrook Island.

At the Cordova Boat Harbor, wind gusts reached 72 mph as measured by a Davis weather system.

Strong winds, gusting to 65 mph, were recorded around Kodiak Island Wednesday morning.

Brisk easterly winds, gusting from 45 to 60 mph across many exposed areas of the Kenai Peninsula triggered 55 power outages due to falling trees across power lines.

AKZ020

Aleutian Islands

26	0500AST	0	0	High Wind (G55)
27	2100AST			

A vigorous front moving slowly east across the Aleutians was preceded by gusty southeast winds. Gusts from 40 to locally 65 mph were reported by the few automated stations in the area and by offshore ships.

AMERICAN SAMOA

NOT RECEIVED.

ARIZONA, Central and Northeast

Yavapai County

Cottonwood

11	1317MST	0	0	0	0	Hail (1.00)
-----------	----------------	----------	----------	----------	----------	--------------------

A Cottonwood weather spotter reported one inch diameter hail.

Gila County

5 S Payson

11	1345MST	0	0	0	0	Funnel Cloud
	1350MST					

Numerous reports of a long lived funnel cloud south of Payson. A picture of the classic shaped funnel cloud made the front page of the local Payson paper.

Coconino County

13 N Grand Canyon Arp

11	1518MST	0	0	0	0	Hail (1.00)
-----------	----------------	----------	----------	----------	----------	--------------------

Grand Canyon park officials reported one inch diameter hail falling at the North Rim.

Yavapai County

Mayer

11	1740MST	0	0	0	0	Urban/Sml Stream Fld
	2045MST					

Thunderstorm rains of two inches in two hours forced Big Bug Creek out of its banks with over one foot of water across nearby roadways.

Yavapai County

15 SW Seligman

11	1805MST	0	0	0	0	Hail (1.75)
-----------	----------------	----------	----------	----------	----------	--------------------

Law enforcement officials reported 1.75 inch diameter hail falling across portions of Interstate 40 between exits 103 and 109.

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>ARIZONA, Central and Northeast</u>									
Yavapai County									
Paulden	14	0730MST			0	0	0	0	Hail (0.75)
Yavapai County									
Prescott	14	1038MST			0	0	0	0	Hail (0.75)
Yavapai County									
10 NE Prescott	14	1100MST 1115MST			0	0	0	0	Hail (1.00)
Yavapai County									
10 NE Prescott	14	1220MST			0	0	0	0	Hail (0.75)
Yavapai County									
Paulden	14	1320MST			0	0	0	0	Funnel Cloud
Yavapai County									
10 NE Prescott	14	1345MST			0	0	0	0	Hail (1.00)
Yavapai County									
8 E Chino Vly	14	1352MST	0	0	0	0	0	0	Tornado (F0)
Yavapai County									
10 NE Prescott	14	1620MST			0	0	0	0	Funnel Cloud
Yavapai County									
10 NE Prescott	14	1624MST			0	0	0	0	Hail (0.75)
Yavapai County									
Dewey	14	1625MST			0	0	0	0	Hail (0.75)
Yavapai County									
Dewey	14	1625MST			0	0	0	0	Thunderstorm Wind (G52)
Yavapai County									
Black Canyon City	14	1628MST			0	0	0	0	Hail (1.00)
Yavapai County									
Cottonwood	14	1700MST			0	0	40K	0	Lightning
A stationary trough of low pressure centered over Nevada introduced strong westerly vertical shear to northern Arizona. This shear combined with the ever present monsoon moisture to produce numerous reports of severe weather across Yavapai county. The tornado 8 miles east of Chino Valley was observed to land in an open field and did no damage. Lightning started a house fire in Cottonwood.									
Yavapai County									
10 E Prescott to 10 W Prescott	14	1622MST	0	0	0	0	0	0	Tornado (F0)
Law enforcement officials reported a tornado touching down briefly west of the Prescott Country Club.									
Yavapai County									
10 NE Prescott	15	1700MST			0	2	18M	0	Hail (2.75)
Yavapai County									
Dewey	15	1713MST 1719MST	0	0	0	0	0	0	Tornado (F0)
Yavapai County									
Dewey	15	1723MST 1727MST			0	0	0	0	Hail (1.75)
For the second day in a row, vertical wind shear combined with monsoon moisture to produce several instances of severe weather. Hail did significant damage in Prescott Valley and in Dewey, with newspaper accounts indicate widespread damage to cars and skylights. Insurance claims from this days severe weather were approximately \$18 million dollars. Two people were injured by the falling hail.									
Coconino County									
4 E Winona	16	1400MST	0	0	0	0	0	0	Tornado (F0)
A witness of this brief tornado was interviewed by a channel 3, a local TV station, the day of the event. In the interview, the witness described the rope like tornado descending from the cloud, and touching the ground twice in an open field.									
Yavapai County									
Chino Vly	16	1614MST			0	0	0	0	Hail (1.00)
A weather spotter reported one inch diameter hail falling in Chino Valley.									
Coconino County									
Munds Park to Sedona	23	1330MST 1930MST			0	0	0	0	Urban/Sml Stream Fld
Yavapai County									
2 NE Rimrock	23	1918MST			0	0	0	0	Flash Flood
Very heavy rain across the western Mogollon rim produced small stream flooding in the Oak Creek basin. On the Wet Beaver Creek northeast of Rimrock, stage rises of 5 feet in one hour were detected by USGS gages.									

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>ARIZONA, Northwest</u>									
Mohave County 40 E Kingman to 40 ENE Kingman	11	1155MST 1200MST			0	0			Hail (1.00)
									A weather spotter at the Diamond M Ranch reported a brief hail storm with hail stones ranging from three-quarters (0.75) to one inch (1.0) in diameter.
Mohave County 10 S Peach Spgs	11	1724MST			0	0			Hail (1.75)
									Golfball sized hail was reported near I-40 along the Mohave/Yavapai county line. No damage reports were received.
Mohave County 40 ENE Kingman	11	1740MST			0	0			Hail (0.75)
									Additional large hail was again observed at the Diamond M Ranch with hailstones generally around three-quarters (0.75) of an inch.
Mohave County 20 S Bullhead City to Temple Bar Marina	13	2140MST 2245MST			0	0	25K		Thunderstorm Wind
									Strong thunderstorm winds swept through an area extending north from Mohave Valley to Temple Bar Marina on Lake Mead. Power was knocked out to 300 homes and business in Mohave Valley and Bullhead City due to downed power poles and several tree branches being blown into power lines. Estimated wind gusts up to 65 miles an hour occurred along Lake Mohave and some awnings were damaged at Temple Bar.
Mohave County Kingman	18	1755MST			0	0	15K		Flash Flood
									Heavy rainfall in the Kingman area caused area washes to flood. Several cars were caught in flood waters and at least one swift water rescue was performed.
<u>ARIZONA, South</u>									
Pima County Vail	13	1323MST			0	0			Hail (0.75)
Greenlee County 30 N Clifton	15	1315MST			0	0			Tstm Wind/Hail
									High winds and 2-3" of hail passed through the Rose Peak area. Snow plows were needed to clear Highway 191.
Pima County Tucson	19	1331MST 1346MST			0	0	2.5K		Tstm Wind/Hail
									A severe thunderstorm produced marble sized hail and high winds which uprooted 40-60 foot trees. Also some minor flooding damaged a swimming pool and the interior of a week-old Porsche.
Pinal County Eloy	19	1340MST			0	0			Hail (0.75)
<u>ARIZONA, Southwest</u>									
Maricopa County Mesa	01	2000MST 2100MST			0	0			Urban/Sml Stream Fld
Maricopa County 10 N Sun City	11	1900MST 2100MST			0	0			Heavy Rain
									About 2 inches of rain fell in about 2 hours.
Maricopa County Chandler to Mesa	14	1655MST 1715MST			0	2	5M		Thunderstorm Wind (G75)
									Winds blew down power poles, trees, and caused considerable damage to homes and businesses in the East Valley. A family in Mesa was trapped inside their vehicle for about an hour after power poles crashed down around them. Power outages affected at least 8,500 customers in the East Valley. The Mesa Regal RV Resort suffered major damage as three trailers were totally destroyed. An airplane was flipped over at Falcon Field with damage to hangar doors. Sky Harbor airport reported numerous flight delays.
Maricopa County Mesa	14	1709MST 1715MST			0	0			Hail (1.50)
									Large hail reported from several spotters in East Mesa.
Maricopa County Phoenix	14	1735MST			0	0			Hail (1.50)
									A series of thunderstorms developed quickly and moved northeast through the east side of the city.
Maricopa County 15 NW Phoenix	14	1735MST			0	0	2M		Thunderstorm Wind (G65)
									Considerable damage in NW Phoenix and Peoria due primarily to strong wind.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
ARIZONA, Southwest									
Maricopa County									
Mesa	14	2000MST			0	1			Lightning
									A 32-year old woman was knocked unconscious as lightning struck a nearby tree.
Pinal County									
5 W Casa Grande	14	2015MST			0	0			Thunderstorm Wind (G70)
									Winds destroyed at least one mobile home and damaged others in the Casa Grande West subdivision.
Pinal County									
Apache Jct	15	1645MST			0	0			Hail (1.00)
Pinal County									
Coolidge	15	1646MST			0	0			Hail (0.75)
Pinal County									
3 W Superior	15	1730MST			0	0			Hail (0.75)
									Large hail was reported throughout the area along with heavy rain. One spotter about 7 miles east of Superior, at Top of the World, reported 1.10 inch in just 25 minutes.
La Paz County									
12 S Parker	16	1612MST			0	0			Hail (1.00)
La Paz County									
Vicksburg	16	1833MST			0	0			Hail (0.75)
Gila County									
Roosevelt	16	2230MST 2305MST			0	0			Urban/Sml Stream Fld
									About 2 inches of rain fell in about 15 minutes and resulted in street flooding.
Maricopa County									
Scottsdale	19	1315MST 1328MST			0	0	100K		Thunderstorm Wind (G70)
									Major roof damage at a strip mall on East Indian School Road.
Pinal County									
10 NW Coolidge	19	1331MST 1345MST			0	0	100K	50K	Hail (1.25)
									Hail and strong winds ripped through the Coolidge area and damaged thousands of acres of cotton just weeks before it would have been harvested.. Trees were uprooted in Coolidge, and power poles were down in Coolidge and Florence. Heavy rain was also recorded at the Casa Grande Ruins National Monument where 2.02 inches fell in about 45 minutes. About 41 homes in Blackwater, on the Gila River Indian Community, had either roof damage, broken windows, or door and skirting damages.
Pinal County									
Florence	19	1335MST 1340MST			0	0	30K		Thunderstorm Wind (G60)
									Windows blown out of the guard towers, and roof torn off at the nearby prison. Nearby Sacaton, on the Gila River Indian Community, had 13 homes damaged by the storm. Minor and major roof damages, coolers damaged, windows broken, carport damage, trailer sidings and trailer damages.
Maricopa County									
Laveen	19	1400MST 1600MST			0	0	165K		Thunderstorm Wind (G80)
									Four homes were reported damaged, with ceiling leaks, damaged windows, minor and major roof damage, and one home partially habitable.
Maricopa County									
Mesa	19	1515MST			0	2	30M		Thunderstorm Wind (G90)
									Microburst winds struck the Desert Sands Trailer Park where at least 14 homes were totally destroyed and about 340 homes were damaged. Over 200,000 customers lost power after more than 40 power poles were snapped by the winds and rain. Talley Industries, on Greenfield Road received about \$500,000 in damage as a large portion of the roof was removed by wind. A large truck was overturned near 80th Street and Baseline Road. Trees were uprooted in nearby Gilbert.
Maricopa County									
Sun City	19	2200MST 2220MST			0	0			Thunderstorm Wind (G70)
									Winds gusted to 81 mph along with 1.9 inches of rain in Sun City West. Portions of two roofs were removed and dozens of trees were blown over at the Grandview Golf Course.
Yuma County									
Wellton	20	1620MST			0	0			Thunderstorm Wind (G60)
									Power poles down.
Maricopa County									
Mesa	14	1709MST			0	0			Hail (0.75)
									Large hail reported at Higley and Broadway Road.
Maricopa County									
Mesa	19	1515MST			0	0			Hail (1.00)

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

September 1999

ARKANSAS, Central and North Central

Ouachita County 4 W Chidester	01	1545CST			0	0			Thunderstorm Wind (G50)
									Thunderstorm winds downed some trees about 4 miles west of Chidester.
Ouachita County 5 E Stephens	05	1525CST			0	0			Thunderstorm Wind (G50)
									Thunderstorm winds blew down a few large tree limbs 5 miles east of Stephens.
Ouachita County 2 N Stephens	05	1615CST			0	0			Thunderstorm Wind (G50)
									Thunderstorm winds downed trees along Highway 57 about 2 miles north of Stephens.
Yell County Waltreak	07	1645CST			0	0			Thunderstorm Wind (G50)
									Thunderstorm winds downed a few power lines near Waltreak.
Yell County Briggsville	07	1710CST			0	0			Hail (0.75)
Jefferson County Pine Bluff	08	0900CST			0	0			Lightning
									Lightning struck a section of underground cable in Pine Bluff. Power was knocked out for awhile in parts of the downtown area, with business disrupted for about two hours.
Pike County 4 W Murfreesboro	12	1930CST			0	0			Hail (0.75)
Pike County 3.5 WSW Murfreesboro	12	1930CST			0	0			Thunderstorm Wind (G61)
									Thunderstorm winds were estimated around 70 mph roughly 3.5 miles west-southwest of Murfreesboro. Tin roofs were removed from chicken houses, and a couple of barns also sustained some roof damage. A newly remodeled antique house had part of its tin roof peeled back. A shed roof was also blown onto a van. Numerous trees and power lines were blown down as well.

ARKANSAS, East

Greene County Paragould	12	2234CST 2240CST			0	0	5K		Lightning
									A fire in the press room of a local newspaper was caused by lightning.

ARKANSAS, Northwest

Benton County Centerton	04	1600CST			0	0	2.5K		Thunderstorm Wind
									Trees and power lines were blown down in Centerton.
Benton County Pea Ridge	04	1630CST			0	0	11K		Thunderstorm Wind
									Trees and power lines were blown down in Pea Ridge. One tree was blown onto a car, destroying the car.
									Scattered thunderstorms developed on the afternoon of Sept. 4 well in advance of a cold front moving south. These storms produced isolated reports of damaging winds in Benton County.
Benton County Gentry	07	1855CST 1900CST			0	0			Hail (1.00)

ARKANSAS, Southeast

NONE REPORTED.

ARKANSAS, Southwest

Little River County 4 SSE Ashdown	05	1330CST 1600CST			0	0			Thunderstorm Wind (G65)
									Several large trees down.
Little River County 10 SW Ashdown	05	1415CST			0	0			Thunderstorm Wind (G55)
									Numerous trees down.
Hempstead County 10 N Hope	05	1520CST			0	0			Thunderstorm Wind (G52)
									Several large trees down.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

CALIFORNIA, Extreme Southeast

Imperial County

Imperial **10** **1746MST** **0** **0** **Urban/Sml Stream Fld**
Considerable street flooding in and around Imperial as radar estimated amounts over 1.50 inches per hour.

CALIFORNIA, North Central

Plumas County

Bucks Lake **01** **0001PST** **0** **0** **Wild/Forest Fire**
14 **1800PST**

The MHRD Complex which began in August and ended in middle September included 12 separate lightning caused fires. Fire suppression costs exceeded the 13 million dollar mark for the event. The fires threatened Buck's Lake necessitating a structure protection group. Other threats were made outside of the Buck's Lake area and included private land, private and public high value timber lands and timber sales. Biomass operations on National Forest Lands, historic and prehistoric structures on several fires, an endangered Spotted Owl habitat, an endangered Red and Yellow Legged Frog habitat, power houses and a game refuge were all at significant risk.

Butte County

Bloomer **01** **0001PST** **0** **0** **Wild/Forest Fire**
05 **1800PST**

The Butte Command #1 Complex burned 33,924 acres across central Butte county. The complex burned from the 23rd of August through the 5th of September. Dry lightning was responsible for the 6 separate large fires with the largest fire burning over 16,000 acres. Strong winds, hot temperatures, steep terrain, and narrow access roads hampered the control process throughout the event. Major drainages, watersheds, and structures were threatened. Fire fighting costs exceeded 11 million dollars.

Shasta County

10 NW Redding **01** **0001PST** **0** **3** **Wild/Forest Fire**
02 **1800PST**

The Spring Incident (formerly known as the Sugarloaf Incident) was responsible for burning 900 acres from August 23rd through September 2nd. Three minor injuries and zero deaths were reported. This lightning caused incident contained two main fires which burned together. The fires destroyed a park for recreation vehicles as well as threatened timber and recreational trails. Fire suppression costs totalled \$835,000 for the 11 day event.

Nevada County

Cedar Ridge **09** **1200PST** **0** **0** **15K** **Lightning**
1300PST

A single lightning strike carved out a 24 square foot section of roof in a two story, Cedar Ridge home. A second floor bedroom was destroyed. No injuries or deaths occurred.

Calaveras County

Countywide **09** **1200PST** **0** **0** **Lightning**
1300PST

Lightning disrupted service for 7,000 PG&E customers. County officials reported dozens of grass fires were started as well, but were all quickly contained. No injuries or deaths were reported.

Tuolumne County

Countywide **09** **1200PST** **0** **0** **Lightning**
1300PST

Lightning disrupted service for 2,300 PG&E.

Calaveras County

West Pt **09** **1340PST** **0** **0** **290K** **Wild/Forest Fire**
11 **1800PST**

The Winton Incident was responsible for burning 120 acres. Fire suppression costs totaled \$450,000. Moderate winds as well as steep terrain hampered the control process. Two homes and two out buildings, one car and one recreational vehicle were destroyed.

Stanislaus County

Westley **22** **0800PST** **0** **0** **Lightning**
30 **2359PST**

Lightning was responsible for a 4.5 acre fire consisting of nearly 5 million used tires.

CAZ015

Northern Sacramento Valley
26 **0320PST** **0** **0** **High Wind (G44)**
28 **1600PST**

North winds of 41 and 44 mph were recorded at Red Bluff and Corning.

Shasta County

10 SW Redding **26** **1047PST** **0** **1** **4.5M** **Wild/Forest Fire**
30 **2359PST**

The Canyon Incident was an equipment caused fire but was exacerbated by north, dry winds on the 27th and 28th. The winds were measured between 30 and 40 mph. One injury and zero deaths were reported. The fire was responsible for burning over 2,000 acres by months end as well as destroying 80 structures. Numerous vehicles and recreational vehicles were also lost.

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>CALIFORNIA, North Central</u>									
Tehama County									
Mill Creek	28	0600PST			0	0			Wild/Forest Fire
	30	2359PST							
The Gun 2 Incident was a civilian caused fire but was exacerbated by high winds, low relative humidity, heavy fuels, and inaccessibility. No injuries or deaths were reported. By months end, fire suppression costs added up to \$587,000 and acres burned totaled 31,342.									
Yolo County									
Guinda	28	1158PST			0	6			Wild/Forest Fire
	30	0000PST							
The Rumsey Incident was responsible for burning 3,015 acres. Fire suppression costs approached 1 million dollars. Six injuries and zero deaths were reported. The fire threatened structures and closed Highway 16 from Rumsey to Highway 20. Erratic winds and steep terrain prolonged the control process.									
<u>CALIFORNIA, Northeast</u>									
Lassen County									
Herlong	13	0630PST			0	0	0	0	Funnel Cloud
		0645PST							
Unconfirmed report of funnel cloud over Honey Lake Basin in eastern Lassen County.									
<u>CALIFORNIA, Northwest</u>									
Trinity County									
5 N Denny	01	0000PST			0	0			Wild/Forest Fire
	30	2359PST							
Megram and Onion Fires that began in August continued through September. On the 24th, high winds pushed the fire into an area of trees blown down three years ago rapidly expanding the blaze. A total of 59,000 acres were burned as of September 18.									
<u>CALIFORNIA, South Central</u>									
Mariposa County									
Coulterville	09	1030PST			0	0			Lightning
		1100PST							
Four (4) lightning strikes were observed by an OES Fire Official in the vicinity of Coulterville. The strikes all produced small fires. No injuries or damage was reported except for the costs of suppression.									
Tulare County									
9.3 NNE Lodgepole	18	1200PST			0	0			Wild/Forest Fire
	30	2359PST							
The "Williams Fire" was caused by lightning strikes on 9/18 but was allowed to burn and managed as a "resource" burn through October (although truncated for report purposes in September). It burned a total of 500 acres. No fatalities or structures lost. Cost to manage unknown.									
Madera County									
9 E Madera	21	2209PST			0	0			Lightning
	22	0030PST							
Tulare County									
2 S Visalia Arpt	22	0710PST			0	0			Lightning
		1350PST							
CAZ021									
	22	0730PST			0	0		5M	Unseasonal Rain
		2200PST							
Moisture from former Hurricane Hilary spread northward into Interior Central California very late on Tuesday, September 21st and over the entire area by Wednesday, September 22nd. Very light rain showers were reported as far north as Madera Ranchos in Central Madera County by midnight with some thunderstorm activity. In the mid-morning hours of the 22nd, locally heavy rain showers occurred with thunderstorms primarily in the Tulare County area and North Kern County. Spotters reported 0.40" of rain from these showers. Only a few hundredths occurred in other Interior Central California Valley locations. Lightning strikes throughout the San Joaquin Valley portion of Tulare County caused 9700 customers to lose power. Although rain forecasts were issued with good lead time...some growers in Tulare County were unable to get crews to roll raisins on about 1000 acres with as much as 50% loss of the crop.									
Tulare County									
Visalia	22	1930PST			0	0			Lightning
		1935PST							
Lightning struck two poles in Visalia around 0730 PST.									
Kern County									
3 SSW (Bfl) Meadows Fire	22	2245PST			0	0			Lightning
Kern County									
Wasco	23	0805PST			0	0			Lightning
Light sprinkles and lightning occurred over the Southern San Joaquin Valley floor late the night of the 22nd and early on the morning									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

CALIFORNIA, South Central

of the 23rd as thunderstorms moved over the area. Primary thunderstorm activity was in the surrounding mountain and desert areas.

Mariposa County **6 NNW El Portal**

23 1500PST 0 0 Lightning
1600PST

Two (2) lightning strikes observed by OES Fire official in the vicinity of Crane Flat, NNW of El Portal, in the mid to late afternoon hours. Both strikes produced small fires but were controlled. No reported damage other than fire suppression.

CAZ021-024

28 1700PST 0 0 Red Flag Fire Wx
29 0830PST

Sustained relative humidity values were noted at meso-net RAWS sites in the extreme Southern San Joaquin Valley, Kern County Mountains, and the Coast Range to the west of the Interior Central California CWFA.

CALIFORNIA, Southeast

San Bernardino **County**

3 SW Baker 12 1515PST 0 0 40K Hail (2.00)

Large hail fell over Interstate 15 near Baker. Numerous cars reportedly sustained dents and broken windshields.

CALIFORNIA, Southwest

San Bernardino **County**

3 S Lucerne Vly to 01 0000PST 0 7 Wild/Forest Fire
4 NW Fawnskin 09 1700PST

This wild fire started on August 28 and was only 20 percent contained as September began. On September 4 it was 100 percent contained by 2765 firefighters after consuming 63,486 acres. Fire fighters continued to mop up hot spots inside the containment line through mid September. Thirteen fire fighters sustained minor injuries in fighting this fire, six of these occurred in late August and seven in early September. Property damage occurred in August as the fire moved through the Apple and Lucerne Valleys. The cost of fighting the fire was \$11.7 million.

Riverside County

3 W Mountain Center to 01 0000PST 0 3 Wild/Forest Fire
7 SE Mountain Center 09 1700PST

This fire began on August 28 and was not fully contained until September 9. A total of 4 people were injured and over 3300 acres consumed.

Riverside County

5 SE Banning to 01 0000PST 0 0 Wild/Forest Fire
13 S Banning 02 0700PST

This fire began on August 28 and was not fully contained until September 2. A total of 1562 acres were burnt. No additional property damage was reported with this fire.

San Diego County

7.5 SE Ocotillo Wells to 13 1615PST 0 0 30K Urban/Sml Stream Fld
12 S Ocotillo Wells 1800PST

A near stationary thunderstorm over the Vallecito Mountains dropped over four inches of rain in two hours. Sheet flow occurred along the east side of the mountains. Alma Creek overflowed and washed out half of the south bound lane of Split Mountain Road. Farther south at the junction of Matthew Canyon Wash and Fish Creek, a 200 yard wide section of the same road was washed out.

Riverside County

March Afb to 21 1200PST 0 0 10K Tstm Wind/Hail
Moreno Valley 1230PST

San Bernardino

County

Highland 21 1215PST 0 0 5K Tstm Wind/Hail
1230PST

Thunderstorm downdrafts caused a 38 mph wind gust at March Air Reserve Base, a power line to snap in Highland, and knocked down a shallow rooted tree in Moreno Valley.

San Diego County

14 E San Onofre 28 0830PST 0 0 Wild/Forest Fire
30 1700PST

About 1000 acres were burned over a two day period on a U.S.M.C. Camp Pendleton weapons firing range.

San Diego County

2 SW Indian Spgs to 30 1330PST 0 0 Wild/Forest Fire
4 SW Indian Spgs 2359PST

A wild fire burnt 1000 acres. The fire was still uncontained as September ended.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	
Character of Storm									

CALIFORNIA, Southwest

San Diego County

10 E Rincon to 30 1400PST 0 0 Wild/Forest Fire
9 E Rincon 2359PST

A wild fire had burnt 650 acres on the La Jolla Indian Reservation as September ended. No property damaged had occurred, but 115 campers and counselors were evacuated from the Denver Fox campground.

Riverside County

3.5 SW Corona to 30 1400PST 0 0 500K 500K Wild/Forest Fire
2.9 SW Corona 2359PST

A wild fire broke out in Tin Mine Canyon and burned towards subdivisions on the southwest side of Corona, destroying one house and damaging five others. Erratic winds then caused the fire to burn both towards the east, threatening additional houses, and back towards the west up the canyons in the Cleveland National Forest. As September ended the fire was still uncontained, with 250 acres of brush and citrus groves burnt, and over 200 homes evacuated.

CALIFORNIA, Upper

CAZ011>012

01 0001PST 0 0 Extreme Cold
0800PST

See below.

A Frost Warning was issued at 0440 PDT on 08/31/99, and cancelled at 0800 PDT on 09/01/99. Reported low temperatures were in the upper 20s to middle 30s. One station, Mt. Hebron, reported a low of 28 degrees, which was 15 degrees below normal. Such abnormally cold temperatures were probably not widespread.

CAZ011>012

01 1635PST 0 0 Extreme Cold
02 0800PST

See below.

Reported low temperatures this morning ranged from the middle 30s to lower 40s. Although no frost was reported, some probably did occur this morning.

CAZ011>012

02 1655PST 0 0 Extreme Cold
03 0800PST

See below.

Reported low temperatures were in the 30s. Although no frost was reported, it probably did occur.

CAZ011>012

26 1420PST 0 0 Extreme Cold
27 0800PST

See below.

Reported low temperatures ranged from the middle 20s to the middle 30s. No frost was reported, but it probably did occur. Mt. Hebron reported a low of 23 degrees, which was 15 degrees below normal. However, such abnormally low temperatures were probably not widespread.

CAZ011>012

27 0511PST 0 0 Extreme Cold
28 0800PST

See below.

Reported low temperatures were mostly in the 30s and colder. No frost was reported, but it probably did occur.

CALIFORNIA, West South Central

Los Angeles County

15 N Glendora 01 0000PST 0 0 Wild/Forest Fire
05 1800PST

The Bridge Fire, which started in late August, was finally contained. The wildfire burned 7,234 acres in the Angeles National Forest.

CALIFORNIA, Western

Monterey County

20 S Carmel 08 1200PST 0 0 66.9M Wild/Forest Fire
30 0800PST

A surface low off the CA Coast brought tropical moisture and mild instability over the coastal CA area and lightning continued through the night over the entire Central Coast and San Francisco Bay area.

Kirk Complex (consisted of Tassajara, Five, Big Pine, Elephant, Lone

Pine, Freed, 7, Torre, Devil, Kirk and Hare Fires) Complex was divided into the North and South Components).

Cause: Lightning strikes

Location: In the Ventana Wilderness approximately 20 miles Southeast

of Carmel, CA. Monterey Co.

Size: 85,634 acres (as of 10/19/99)

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

CALIFORNIA, Western

Containment: October
Fatalities: none
Structures Lost: none
Cost: \$66.9 million (as of 10/19/99)

COLORADO, Central and Northeast

Weld County									
10 E Platteville	01	1359MST			0	0			Hail (0.75)
Larimer County									
1 E Red Feather Lakes	01	1400MST			0	0			Hail (0.75)
Weld County									
5 E La Salle	01	1413MST	0.1	25	0	0	0	0	Tornado (F0)
Weld County									
6 E La Salle	01	1421MST			0	0			Hail (0.75)
Douglas County									
Castle Rock	01	1533MST			0	0			Thunderstorm Wind (G50)
Logan County									
17 WNW Sterling to	01	1626MST			0	0			Hail (1.50)
15 WNW Sterling		1635MST							
Logan County									
17 WNW Sterling	01	1626MST			0	0			Thunderstorm Wind (G57)
Logan County									
8 W Iliff	01	1643MST	0.1	25	0	0	0	0	Tornado (F0)
Larimer County									
Ft Collins	01	1738MST			0	0		0	Lightning
Larimer County									
Ft Collins	01	1746MST			0	0			Hail (1.00)
Heavy rain, large hail, damaging straight-line winds, tornadoes and lightning struck portions of the northeast plains of Colorado. In Fort Collins, large hail caused extensive damage to automobiles in the area. In addition, large tree limbs, 5 inches in diameter, were snapped along with a few power poles that measured 8 inches in diameter. Millet crops in the area were also flattened, while corn and sunflower crops were stripped. Lightning struck the Fort Collins Police Department's radio tower, temporarily disabling the 911 system. Heavy rain, up to a half an inch in 15 minutes, caused minor flooding at the CSU Campus. Two small tornadoes touched down briefly near the towns of Iliff and La Salle, but did no damage.									
Boulder County									
1 N Longmont	02	1610MST			0	0			Hail (0.75)
Weld County									
6 E Platteville	02	1615MST			0	0			Hail (1.00)
Weld County									
La Salle	02	1718MST			0	0			Hail (0.75)
Weld County									
6 E La Salle	02	1720MST			0	0			Hail (0.75)
Weld County									
Kersey	02	1725MST			0	0			Hail (0.75)
Morgan County									
23 W Ft Morgan	02	1755MST			0	0			Hail (1.50)
Weld County									
3 SW New Raymer	02	1856MST			0	0			Hail (0.75)
Weld County									
14 NE New Raymer	02	1949MST			0	0			Hail (1.75)
Adams County									
Aurora Cherry Creek	03	1450MST			0	0			Hail (0.75)
Adams County									
Aurora Cherry Creek	03	1504MST			0	0			Hail (1.00)
Adams County									
12 N Bennett	03	1558MST			0	0			Hail (1.00)
Denver County									
Denver	03	1637MST			0	0			Hail (0.75)
Weld County									
Gilcrest	03	1640MST			0	0			Hail (1.75)
		1655MST							
Weld County									
Greeley	03	1655MST			0	0			Hail (1.75)

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------	---------------------------------	---------------------------------	-------	--------------------

COLORADO, Central and Northeast

Morgan County

5 S Ft Morgan **03** **1755MST** **0.1** **25** **0** **0** **0** **0** **Tornado (F0)**
A tornado touched down briefly but did no damage.

Logan County

2 N Merino **03** **1821MST** **0** **0** **Hail (1.75)**

Weld County

Greeley **03** **1825MST** **0** **0** **Hail (1.00)**

Logan County

7 ESE Sterling **03** **1900MST** **0** **0** **Hail (1.00)**

Weld County

4 NW Greeley **03** **1900MST** **0** **0** **Hail (0.75)**

Logan County

5 W Fleming **03** **1925MST** **0.1** **25** **0** **0** **0** **0** **Tornado (F0)**
A tornado touched down briefly but did no damage.

Logan County

Dailey **03** **1930MST** **0** **0** **Hail (1.75)**

Phillips County

5 NW Haxtun **03** **1930MST** **0** **0** **Hail (1.75)**

Sedgwick County

13 S Ovid **03** **2015MST** **0** **0** **Hail (1.25)**

Large hail damaged homes and automobiles in Weld, Logan, Sedgwick and Phillips Counties.

COZ035

Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins

25 **1030MST** **0** **0** **0** **High Wind (G78)**
1700MST

High winds developed in the foothills of Boulder and Larimer Counties. Wondervu registered a peak wind gust to 90 mph (78 kts), while Red Feather Lakes topped out at 70 mph (61 kts).

COZ035>036-038>040-043>044

Northern Front Range Foothills/Upper Laramie And Cache La Poudre River Basins - Southern Front Range Foothills/Clear Creek Basin - Eastern Larimer And Northwestern Weld Counties - Eastern Boulder County/Boulder And Vicinity - Denver Metropolitan Area - Southern Weld County/Greeley And Vicinity - Morgan County/Fort Morgan And Vicinity

28 **0145MST** **0** **0** **0** **Heavy Snow**
1400MST

Heavy snow developed in the Front Range Foothills and portions of the adjacent plains. Snowfall totals included: 12 inches at Allenspark, 10 inches near Buckhorn Mountain, 8 inches at Estes Park, Hourglass Lake and Red Feather Lakes, 7 inches at Conifer and 4 miles south of Livermore, with 6 inches, 9 miles west-southwest of Rustic. Although the snowfall in the plains was not a great, generally ranging from 1 to 4 inches; it did cause problems. The heavy wet snow snapped branches from fully leafed trees, downing power lines and causing scattered outages.

COLORADO, East Central

Yuma County

12 N Eckley **03** **1935MST** **0** **0** **Hail (0.75)**

Cheyenne County

7 SW Cheyenne Wells **11** **1317MST** **0** **0** **Thunderstorm Wind (G53)**

COLORADO, South Central and Southeast

NONE REPORTED.

COLORADO, West

Gunnison County

Marble **16** **2000MST** **0** **0** **15K** **Flash Flood**
2010MST

Heavy rains resulted in a rockslide which damaged two vehicles.

Mesa County

Grand Jct **19** **1530MST** **0** **0** **25K** **Flash Flood**
1600MST

Flash flooding was reported at many locations within the Grand Junction metropolitan area, including Clifton and Redlands. Water up to 2 feet deep was running down some streets. Doppler radar indicated about an inch of rain fell over the area primarily within a half hour. The high water produced minor damage to some vehicles and residences.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------	---------------------------------	---------------------------------	-------	--------------------

CONNECTICUT, Northeast

CTZ002

Hartford

07 0000EST

0

0

Record Warmth

09 2359EST

Record warm low temperatures were set or equaled at Bradley International Airport in Windsor Locks.

The low temperature of 71 degrees on the 7th broke the previous record of 68 degrees, which was set in 1943. On the 8th, the low of 72 degrees broke the previous record of 70 degrees, set in 1916. And on the 9th, the low of 70 degrees tied the record which was set in 1992.

Hartford County

Bristol

10 0700EST

0

0

Heavy Rain

1900EST

Tolland County

Stafford

10 0700EST

0

0

Heavy Rain

1900EST

Windham County

Ashford

10 0700EST

0

0

Heavy Rain

1900EST

A slow moving cold front, combined with tropical moisture arriving from the south, resulted in heavy rainfall across northern Connecticut. The heaviest rain fell in Hartford County, west of the Connecticut River, where totals of up to 4 inches were reported, including 3.57 inches in Bristol. Amounts elsewhere averaged between 2 and 3 inches. No flooding was reported. The rainfall total of 2.78 inches at Bradley International Airport set a new daily rainfall record.

CTZ002-002

Hartford

16 0313EST

0

0

Flood

19 1946EST

Farmington River

Hartford County

Countywide

16 1400EST

0

0

Heavy Rain

17 1300EST

Tolland County

Countywide

16 1400EST

0

0

Heavy Rain

17 1300EST

Windham County

Countywide

16 1400EST

0

0

Heavy Rain

17 1300EST

Hartford County

Southington

16 1640EST

0

0

Flood

18 0443EST

Quinnipiac River

Hartford County

Burlington

16 1817EST

0

0

Flood

17 0231EST

Burlington Brook

CTZ002>004

Hartford - Tolland - Windham

16 2000EST

0

0

Strong Wind

17 0300EST

Hartford County

Hartford

16 2000EST

0

0

Flood

17 1000EST

North Branch Park River

Tropical Storm Floyd brought torrential rainfall and strong winds to northern Connecticut, as it tracked up the Connecticut River valley into central Massachusetts. Although many areas received torrential rainfall, with totals between 4 and 8 inches, the heaviest rain fell in western Hartford County where as much as 10.80 inches was reported in Bristol. The rainfall produced widespread flooding of low lying areas, especially in Hartford County. Smaller rivers such as the Quinnipiac, North Branch Park, and Burlington Brook rose rapidly out of their banks as the heavy rain arrives late in the afternoon and early in the evening on the 16th. Crests of 2 to 3 feet above flood stage occurred by daybreak on the 17th. The Farmington River went into flood at Unionville from 11 pm on the 16th to 413 am on the 17th, cresting a foot above flood stage at 1 am on the 17th. At Simsbury, the Farmington went into flood at 715 am on the 17th and crested about a foot over flood stage at 930 pm on the 17th, before returning to its banks at 215 pm on the 18th. The longer responding Connecticut River rose out of its banks in Hartford at 1259 am on the 18th, and crested at 17.2 feet at 130 pm on the 19th, which is about a foot over its 16 foot flood stage. It returned to its banks at 132 am on the 19th. Farther downstream at Middletown, the Connecticut went into flood at 1050 am on the 18th, and crested at 8.8 feet at 1115 am on the 19th, almost a foot above its 8 foot flood stage. It returned to its banks at 846 pm that same day. Surprisingly, no flood damage was reported, even in those areas where the smaller rivers rose rapidly.

Strong winds were also felt in northern Connecticut as Floyd passed. There were scattered reports of small trees or branches downed,

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

CONNECTICUT, Northeast

which did not cause significant damage.

CONNECTICUT, Northwest

Litchfield County

Countywide

16 1800EST
17 0200EST

0

0

1.1M

Flood

CTZ001

Countywide

Litchfield
16 1825EST
17 0400EST

0

0

100K

High Wind

The remnants of Hurricane Floyd moved up the eastern seaboard on September 16 and during the early hours on September 17. The storm brought both high winds and exceptionally heavy rainfall to northwestern Connecticut, which included a large swath of 5 to 8 inch amounts. Specific rainfall amounts included 5.20 inches at Falls Village, 6.35 inches at Colebrook Dam, 7.89 inches at Bulls Bridge and 8.28 inches at Bakersville. The rain produced widespread flooding across the region, which proved very destructive. Significant flooding was noted on many tributaries, including the Housatonic, and Shepaug Rivers in addition to many smaller streams. The rains not only flooded many roadways but washed out portions of them. One of these washouts included Route 7 in several areas including the Veterans Plaza in New Milford. The Housatonic spilled over at Oxford and Shelton resulting in as many as 35 families being forced to evacuate. Many communities declared a State of Emergency during the overnight of September 16 and 17. The rains, combined with the left-over rain from Tropical Storm Dennis, a week earlier, virtually ended the fourteen month drought across the region.

Winds from the passage of Floyd were estimated to have gusted to over 60 mph across mainly the hilltowns. The combination of the wind and very saturated ground, produced widespread downing of trees and power lines across much of Litchfield county. Some of the trees fell on vehicles and houses. The rain and wind produced power outages across the region with as many as 5,000 left in the dark.

CTZ001

Litchfield
16 1925EST
17 0700EST

0

0

100K

High Wind

CONNECTICUT, Southern

NONE REPORTED.

DELAWARE

DEZ001>004

New Castle - Kent - Inland Sussex - Delaware Beaches

01 0000EST
17 0800EST

0

0

29.1M

Drought

The drought that gripped the Middle Atlantic States throughout much of the growing season eased in mid August. Normal, and in some cases, heavier than normal rainfall returned. On September 8th Governor Thomas Carper lifted the mandatory watering restrictions in Northern Delaware. The drought, for all intents and purposes, ended with the arrival of the record breaking rain associated with Hurricane Floyd on the 16th. As much as 10.5 inches of rain (or about 3 months worth of normal rainfall) fell from Floyd across Delaware. The drought emergency was lifted by Governor Carper on the 21st. The heavy rain came too late to help farmers. Agricultural losses throughout the state of Delaware were estimated at 29.1 million dollars. The 1999 corn harvest of 12.9 million bushels was 2.6 million bushels less than 1998 and the smallest crop since 9.8 million bushels in 1988. The soybean harvest of 5.2 million bushels in 1999 was 1.9 million bushels less than 1998 and the smallest harvest since 4.7 million bushels in 1995. The drought also greatly affected pastures and produced a later and smaller than usual pumpkin crop.

DEZ004

Delaware Beaches

16 0100EST
2200EST

0

0

50K

0

Hurricane

DEZ001>003

New Castle - Kent - Inland Sussex

16 0300EST
2200EST

0

0

High Wind (G57)

New Castle County

Countywide

16 0600EST
17 0300EST
F12IW, F11IW

2

1

8M

Flash Flood

Kent County

Countywide

16 0830EST

0

0

224K

Flash Flood

Sussex County

Countywide

16 0830EST

0

1

150K

Flash Flood

DEZ001>002

New Castle - Kent

16 1400EST
2000EST

0

0

0

Tidal Flooding

Hurricane Floyd battered Delaware (especially New Castle County) on September 16th and brought with it torrential rains and damaging winds. The hurricane caused widespread flash flooding as storm totals averaged around nine inches, most of which fell in a

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	Character of Storm	
Location	Date								

DELAWARE

twelve hour period from the early morning through the afternoon on the 16th. Two girls (an eleven-year-old and a twelve-year-old) drowned when they were swept into a 1,500 foot culvert in Red Lion (New Castle County) during the afternoon of the 16th. An 8-year-old girl who was with them managed to pull herself from the culvert. These were the first hurricane related deaths in the state since Hazel in 1954. The highest verifiable storm total was 10.58 inches in Greenwood (Sussex County). This established a new 24 hour state record. A number of other stations also broke the old state record of 7.83 inches set on June 27, 1938 including the New Castle County Airport (8.29 inches). Based on Doppler Radar storm totals estimate the heaviest rain fell across southern New Castle County. The torrential downpours associated with Hurricane Floyd exceeded the 100-year-flood return period for New Castle County as record crests were set on many rivers and streams. Hundreds of roads and bridges were closed. About 300 people were evacuated to shelters, mainly in New Castle and Sussex Counties. Two people were seriously injured. Dozens more were rescued from trapped vehicles. The combination of winds funneling into Delaware Bay and the runoff from inland waterways produced minor tidal flooding at the times of high tide in New Castle and Kent Counties. The highest wind gusts in most areas were less than 60 mph. But, the combination of the heavy rain that loosened the ground and the persistence of the strong winds uprooted hundreds of trees across the state, especially in the wooded areas of New Castle County. About 25,000 homes and businesses lost power. Power was restored by the 19th. A state of emergency was declared on the 16th and all schools were closed. The preliminary damage estimate was 8.42 million dollars. President Clinton declared New Castle County a disaster area.

Hurricane Floyd began as a Cape Verde type hurricane east of the Lesser Antilles. As Floyd moved west, it passed to the north of and spared both the Greater and Lesser Antilles. Floyd intensified into a Category IV (Major) Hurricane on the Saffir-Simpson Scale. Floyd was also a large sized hurricane that prolonged both the torrential rain and high winds. Floyd was heading for Florida before a turn to the northwest spared the state, but Floyd battered the Bahamas. The anticipated turn to the north and the northeast occurred on the 15th as Floyd was heading for North Carolina. Another important synoptic feature was a cold front that was over West Virginia on the 14th. This front stalled just west of Chesapeake Bay on the 15th. The stalled front not only failed to push offshore an already tropical and humid air mass that was over the state, but also acted as a conduit for the tropical moisture associated with Floyd. The moisture headed west toward the front and then rode north along the boundary. Light rain associated with Floyd started in the state on the 15th. The torrential rain associated with Floyd arrived just after midnight on the 16th and reached northern Delaware by 5 a.m. EDT. Floyd was still offshore south of North Carolina. Floyd made its initial landfall during the early morning hours of the 16th at the Mouth of Cape Fear or Bald Head Island in North Carolina and accelerated as it proceeded northeast. Damaging east winds arrived in Sussex County by 3 a.m. EDT almost coinciding with the torrential rain. Meanwhile a weakened Category One Floyd moved through Virginia Beach, Virginia and was back over the open Atlantic Ocean around noon on the 16th. Floyd continued to move northeast and the eye passed just east of the Virginia Capes and Fenwick Island, Delaware during the mid afternoon. Eyewitness reports stated that the western part of the eye brushed the island. By the afternoon of the 16th all the torrential rain had moved north of Floyd and ended with the passage of the hurricane (on the same latitude line). During the afternoon of the 16th all of the sustained hurricane force winds were located over the Atlantic, although damaging winds continued. Between 4 p.m. and 6 p.m. EDT the torrential rain ended across the state. At 5 p.m. EDT Floyd was downgraded to a tropical storm as it passed about 10 miles east of Atlantic City. But in some cases (especially in New Castle County), the strongest winds associated with Floyd mixed down as cooler air behind the system moved into the region. The strong winds persisted through the evening of the 16th. Wind gusts rarely exceeded 50 mph, but all the flooding rains made it easy for trees to be knocked over. Tropical Storm Floyd made landfall again on western Fire Island in Suffolk County, New York around 8 p.m. EDT and was located near Portland, Maine at 8 a.m. EDT on the 17th.

Floyd hit New Castle County the hardest as the preliminary damages estimates for the county reached 8 million dollars. One hundred twenty-seven homes in the state suffered minor damage, 83 were in New Castle County. All the 44 homes with major damage and 33 homes that were condemned were in New Castle County. The hardest hit community within the county was Glenville (near Stanton) along the White Clay Creek. About 100 homes were flooded with up to six feet of water. During the height of the storm forty roads and bridges were closed including sections of Delaware State Routes 1 and 9. Flooding from Floyd washed away a 200 foot stretch of roadway and embankment of the Silver Lake Bridge. The contents of the lake went down the Appoquinimink River. The road was scheduled to be reopened in Mid December. At about 730 p.m. EDT flooding along the Red Clay Creek washed out two bridges and extensively damaged three others used by the Wilmington Western Railroad (Delaware's oldest) near Prices Corner. Miles of track, trestles and road beds suffered extensive damage estimated at 2.5 million dollars. Full service was not expected to be restored until the summer of 2000. Residents in low-lying areas in Wilmington were asked to evacuate. Flooding occurred and included the Gander Hill Prison. High winds also pulled down numerous trees in the county. One tree fell through and damaged the Center for the Creative Arts in Yorklyn.

Damage in Kent County was more widely scattered. Delaware State Routes 6 and 9 flooded from both the combination of heavy rain and also tides near the bay. Woodland Beach was cut off from mid afternoon until 9 p.m. EDT on the 16th. The St. Jones River flooded in Dover. One house in Dover lost a 38-foot-long section of a foundation. The bridge on Delaware State Route 8 near Marydel was damaged and not reopened until the 24th. Several roads were closed around Smyrna and Clayton from the combination of flooding and downed trees. A downed tree damaged at least one house in Dover.

The worst damage from Floyd in Sussex County occurred inland. Serious flooding problems were reported in Bridgeville, Greenwood and Seaford. Seventy-five percent of downtown Greenwood was submerged under four feet of water. The Seaford Apartments (the elderly) in Seaford were evacuated. The parking lot became inaccessible. In Laurel, a 12-year-old boy was swept into a drainage ditch and carried for half a mile before he was rescued and treated for hypothermia. In South Bethany (because of no dune protection) and Lewes voluntary evacuations of low-lying areas were recommended. But damage along the ocean was minimal. Some beach dune fencing was blown down and minor erosion occurred. Minor tidal flooding occurred along the bayside streets. State Routes 1, 54

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

DELAWARE

and 56 had water on them during high tide.

The Christina River at Coochs Bridge reached its 9 foot flood stage at 7 a.m. EDT on the 16th, crested at a RECORD BREAKING 13.9 feet at 430 p.m. EDT. The White Clay Creek at Delaware Park (Stanton) reached its 13 foot flood stage at 10 a.m. EDT on the 16th, crested at a RECORD BREAKING 17.6 feet at 9 p.m. EDT and was back within bankfull at 4 a.m. EDT on the 17th. The Red Clay Creek at Wooddale reached its 5.5 flood stage at 11 a.m. EDT on the 16th and crested at a RECORD BREAKING 13.9 feet at 7 p.m. EDT on the 16th. The Brandywine Creek at Wilmington reached its 11 foot flood stage at 4 p.m. EDT on the 16th and came within .1 of a foot of tying the record flood stage when it crested at 15.4 feet. The tide gage at Reedy Point (New Castle County) peaked at 7.5 feet above mean lower low water at 406 p.m. EDT. Minor tidal flooding starts at 7 feet above mean lower low water. Storm totals included 10.58 inches in Greenwood (Sussex County - a new state record), 9.75 inches at the Porter Reservoir (New Castle County), 9.49 inches in Newark (New Castle County), 9.18 inches in Wilmington (New Castle County), 8.84 inches in Bear (New Castle County), 8.44 inches at the Dover AFB (Kent County), 8.29 inches at the New Castle County Airport, 7.27 inches in Bridgeville (Sussex County), 6.20 inches in Milford (Sussex County) and 6.11 inches in Georgetown (Sussex County). The highest wind gusts included 64 mph at the Pilot Tower (Sussex County), 60 mph at the Delaware Bay Buoy and 46 mph at the New Castle County Airport. Another unwanted side effect from Floyd was extra mosquitoes.

DEZ001>004

New Castle - Kent - Inland Sussex - Delaware Beaches

30 2359EST 0 0 Unseasonably Wet

Courtesy of Hurricane Floyd, September 1999 went down as one of the wettest Septembers on record in Delaware. The monthly statewide average of 10.13 inches was the second wettest September on record since 1895. On a county weighted average September monthly rainfall totals were 10.1 inches in Kent County, 10.5 inches in Sussex County and 13.0 inches in New Castle County. At the New Castle County Airport 12.68 inches of rain fell during September and was the wettest September of the 20th century.

DISTRICT OF COLUMBIA

DCZ001

District Of Columbia

01 0000EST 0 0 Drought
17 2359EST

Rainfall from two land falling hurricanes finally ended the drought that plagued the Washington area since the summer of 1998. Washington Reagan National Airport reported a rainfall total of 10.27 inches for September, 6.96 inches above normal. It was the 4th wettest September on record. From the 20th of August through the end of September, 14.56 inches of rain fell at National Airport, over a third of the average yearly rainfall. DuPont Circle in Northwest Washington received a total of 9.93 inches during September. The much needed precipitation affected rivers and water reservoirs dramatically. Water restrictions were lifted across the entire metropolitan area by the middle of the month.

**District Of Columbia
Countywide**

05 0200EST 0 0 Heavy Rain
06 1000EST
Minor street flooding; tree limbs and wires downed

**District Of Columbia
Countywide**

05 0300EST 0 0 Storm Surge
06 2000EST

Tides 2 to 3 feet above normal; minor flooding near waterfront

The remnants of Hurricane Dennis moved across the Washington D.C. area from late on the 4th through midday on the 6th. Its legacy included periods of heavy rain, minor street flooding, wind gusts to 35 MPH, and minor tidal flooding along the Potomac River. Washington Reagan National Airport received a storm total of 2.31 inches of rain. In Northwest Washington, DuPont Circle reported a total of 2.51 inches. Scattered power outages occurred when winds of up to 35 MPH downed tree limbs which then fell onto power lines. The storm surge from Hurricane Dennis along with persistent southeast winds made tide levels 2 to 3 above normal on the 5th and 6th. On the 5th, officials put up a flood wall along the river to protect Washington Harbor. River levels reached as high as 6.5 feet at the Wisconsin Avenue gauge during the early morning and late afternoon both days. Flooding was reported at Hains Point and in Georgetown during high tide. Flood stage is 7 feet at Wisconsin Avenue, but some low lying areas report flooding at a stage of 5 feet.

DCZ001

District Of Columbia

16 0800EST 0 0 200K Tropical Storm
2300EST

Winds gusted between 40 and 60 MPH, 200 downed trees blocked roads and damaged homes and automobiles

**District Of Columbia
Countywide**

16 0800EST 0 0 Flash Flood
1500EST

Roads closed by high water

Hurricane Floyd made landfall just east of Cape Fear, North Carolina in the early morning hours of the 16th and moved north-northeast across extreme southeast Virginia to near Ocean City, Maryland by evening on the 16th. Rainbands on the outer edge of the hurricane began to affect the Washington D.C. area shortly after 8:00 AM EDT on the 15th and continued to cross the area through afternoon on the 16th. The eye of Hurricane Floyd passed east of the Chesapeake Bay between 9:00 AM and midnight on the 16th. Gusty winds of 40 to 60 MPH blew across the District between 11:00 AM and midnight on the 16th. Children's Hospital reported a wind gust of 56 MPH at 2:13 PM EDT, and Washington National Airport recorded a gust of 55 MPH at 3:00 PM EDT. Two hundred downed trees blocked roads and damaged houses and cars. Downed power lines resulted in 7000 electrical outages. Four schools remained without power through the 18th. Up to 6 inches of rain fell across the city. High water closed Independence

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

DISTRICT OF COLUMBIA

Avenue from 15th to 23rd Street. Rock Creek Parkway was closed from Virginia Avenue to Calvert Street. At 1:45 PM EDT on the 16th, a vacant building in the 600 block of New York Avenue collapsed from rain accumulated on its roof. Rainfall totals included 6.00 inches at Foggy Bottom, 5.57 inches in Upper Northwest, 5.39 inches at Children's Hospital, and 4.57 inches at National Airport.

District Of Columbia Countywide

**30 0010EST
0020EST 0 0 15K Thunderstorm Wind**

Several trees and power lines downed, minor damage to buildings

An area of intense showers moved across the District between midnight and 1:30 AM EDT on the 30th. Winds in excess of 55 MPH blew across the city, downing several trees and power lines. A wind gust of 45 MPH was recorded at Children's Hospital and at Washington Reagan National Airport. A few buildings on Channing Street sustained minor damage from the high winds and 5 trees several feet in diameter and over two stories tall were downed. A tree was also toppled onto a home near the intersection of Warren and 37th Street, and other trees were downed along Rock Creek. National Airport received a total of 1.59 inches of rainfall.

FLORIDA, East Central

Volusia County

2 E New Smyrna Beach 11 1405EST 0 0 Waterspout
A waterspout dissipated briefly just east of New Smyrna Beach. The waterspout dissipated before reaching the coast.

FLZ041-045>047-054- 059 Volusia - Orange - Seminole - Brevard - Indian River - St. Lucie

14 2000EST 0 0 61M Hurricane
15 2000EST

The center of Hurricane Floyd passed about 115 statute miles off the coast of east central Florida on September 15th. The areas hardest hit were coastal sections of Brevard and Volusia counties. Both counties experienced widespread wind gusts to near 70 mph. Initial damage estimates in Volusia County were near \$42 Million. About ten million of that was due to beach erosion. Three hundred thirty plus homes were damaged by wind or falling trees. Thousands of people were left without power. A large section of the Main Street Pier was destroyed by heavy surf in Daytona Beach. In Brevard County damage estimates were near \$10 million. About \$8 million of that was due to beach erosion. A few beach front homes received major damage from surf and wind. Many highrise hotels received water damage from wind driven rain. Thousands of trees and power lines were blown down across the county.

Beach erosion and downed trees and power lines and damage to some homes were also reported across coastal sections of St. Lucie and Indian River counties. Inland, downed trees and power lines and minor wind damage to structures was also reported in Orange and Seminole counties.

Volusia County Oak Hill

19 1730EST 0 0 10K Flash Flood
Heavy rain of 2 to 4 inches produced flooding in Oak Hill. Two homes had minor flooding.

Brevard County Melbourne

25 1700EST 0 0 Urban/Sml Stream Fld
2030EST
Heavy rains of 3 to 5 inches produces street flooding in Melbourne.

Brevard County Melbourne

25 2030EST 0 0 80K Flash Flood
26 1630EST
Numerous thunderstorms passing over Melbourne and Brevard County produced nearly 8 inches of rain flooding numerous roadways. Forty nine homes received minor flooding.

FLORIDA, Extreme Southern

Monroe County

(Eyw)Key West Inl Ar 02 0750EST 0 0 Waterspout
0756EST
Waterspout occurred 15 miles northwest of Key West

Monroe County Islamadora

02 0938EST 0 0 Waterspout
0946EST
Waterspout occurred 1 mile north of Snake Creek near Islamorada

Monroe County Marathon

02 0803EST 0 0 Waterspout
0808EST
Waterspout was 3 miles south of Key Colony Beach

Monroe County

(Eyw)Key West Inl Ar 06 1514EST 0 0 Waterspout
1520EST
2 waterspouts occurred 5 miles northwest of Key West

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
FLORIDA, Extreme Southern									
Monroe County Tavernier	06	1828EST 1836EST			0	0			Waterspout
		Waterspout just offshore Tavernier							
Monroe County Rock Harbor	06	1834EST 1840EST	0.2	20	0	0	0		Tornado (F0)
		Waterspout moved onshore as a tornado. Only minor tree damage was observed in Rock Harbor.							
Monroe County Rock Harbor	06	1834EST 1845EST			0	0			Waterspout
		Waterspout 1 mile north of Rock Harbor							
Monroe County Key Largo	06	1920EST 1931EST			0	0			Waterspout
		Waterspout 1 mile north of Key Largo							
Monroe County Rock Harbor	09	1650EST			0	0	0		Thunderstorm Wind (G50)
		Only minor damage to roofs...shutters and awnings occurred and no dollar amount of the damage was available.							
Monroe County (Eyw)Key West Inl Ar	09	2127EST 2135EST			0	0			Waterspout
		Waterspout was 5 miles northeast of Key West							
Monroe County (Eyw)Key West Inl Ar	19	0855EST 0904EST			0	0			Waterspout
		Waterspout associated with a thunderstorm occurred 1 mile north of Key West.							
Monroe County (Eyw)Key West Inl Ar	19	0907EST 0915EST			0	0			Waterspout
		Waterspout associated with a thunderstorm occurred 1/2 mile north of Key West.							
Monroe County (Eyw)Key West Inl Ar	19	0940EST 0947EST			0	0			Waterspout
		Waterspout associated with a thunderstorm occurred 7 miles north of Key West.							
Monroe County (Eyw)Key West Inl Ar	19	1133EST 1140EST			0	0			Waterspout
		Waterspout observed 1 mile north of Sugarloaf Key about 15 miles northeast of Key West.							
FLZ076-076 Monroe/Upper Keys	21	1230EST 1243EST			0	0	0		Tropical Storm
		A few trees were knocked down in the Ocean Reef area due to Tropical Storm Winds.							
		Tropical Storm Harvey moved across the south Florida mainland from the Gulf of Mexico. There was very little in the way of damage in the Keys associated with Tropical Storm Harvey. The storm surge was approximately 1 foot above normal tide with only minor coastal flooding observed. Highway A1A on the south side of Key West was closed for a few hours due to coastal flooding. The peak winds were as follows:							
		47 knots sustained/ 59 knots gust at Molasses Reef C-MAN station offshore Key Largo.							
		35 knots sustained/39 knot gust at Sand Key C-MAN station offshore Key West.							
		35 knots sustained/37 knots gust at Sombbrero Key C-MAN station offshore Marathon.							
		32 knots sustained/37 knots gust at Key West Int'l airport.							
Monroe County (Eyw)Key West Inl Ar	29	1825EST 1840EST			0	0			Waterspout
		Waterspout occurred 5 miles north of Key West.							
Monroe County (Eyw)Key West Inl Ar	29	1840EST 1855EST			0	0			Waterspout
		Waterspout observed 7 miles north of Key West.							
Monroe County Upper Key Largo	30	1202EST 1210EST			0	0			Waterspout
		Waterspout observed 1 mile east of Card Sound Road.							

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured		Estimated Damage Property Crops	Character of Storm	
<u>FLORIDA, Extreme Southern</u>									
Monroe County									
Marathon	30	1203EST 1209EST			0	0		Waterspout	
		Waterspout observed 2 miles north of Grassy Key.							
Monroe County									
Marathon	30	1213EST 1220EST			0	0		Waterspout	
		Waterspout observed 1 mile north of Conch Key.							
<u>FLORIDA, Northeastern</u>									
Flagler County									
5 NNE Beverly Beach	06	1445EST			0	0		Hail (0.75)	
Flagler County									
4 NNE Beverly Beach to 3 NNE Beverly Beach	06	1500EST			0	0	1.5K	Thunderstorm Wind	
		Large trees blocked roadways in Palm Coast.							
Suwannee County									
Live Oak	07	1305EST			0	0	2.5K	Thunderstorm Wind	
		Large trees and power lines were blown down.							
Gilchrist County									
2 NW Bell	07	1755EST			0	0	15K	Thunderstorm Wind	
		Large trees were blown down. One tree damaged a car traveling on West 32nd Street.							
Duval County									
Jacksonville	14	1330EST			0	0	2.5K	Thunderstorm Wind	
		Large trees and power lines were blown down.							
St. Johns County									
Switzerland	14	1405EST			0	0	3.5K	Thunderstorm Wind	
		Large trees and power lines were blown down.							
St. Johns County									
St Augustine	14	1605EST			0	0	2.5K	Thunderstorm Wind	
		Large trees and power lines were blown down.							
St. Johns County									
Countywide	15	0200EST 0700EST			0	0	35K	Flood	
		Numerous street and homes were flooded .							
St. Johns County									
St Augustine	15	0230EST			0	0	3.5K	Thunderstorm Wind	
		Large trees and power lines were blown down.							
FLZ038									
Flagler	15	0300EST 1800EST			0	0	60K	Hurricane	
		Hurricane Floyd - Flagler Beach Pier was damaged. One mobile home damaged. Marineland received severe structural damage.							
FLZ033									
St. Johns	15	0400EST 2000EST			0	0	3M	Hurricane	
		Hurricane Floyd - Thirty homes damaged, ten hotels with roof damaged. Extensive beach erosion. Six to eight inches of rainfall caused major flooding in St. Augustine. Highest gust at SAUF1 67 mph at 700 AM EST.							
FLZ025									
Duval	15	0600EST 2100EST			0	0	1M	Hurricane	
		Hurricane Floyd - Three homes with major damage, five with minor damage by wind and falling trees. Max wind at JAX 46 mph at 407 AM EST. Extensive beach erosion. More than 100 feet of the Jacksonville Beach was destroyed.							
Suwannee County									
Countywide	15	0600EST 0930EST			0	0	3.5K	Flood	
		Numerous streets and road were flooded.							
Flagler County									
Countywide	15	0800EST			0	0	5.5K	Flood	
		Numerous streets and roads were flooded.							
FLZ024									
Nassau	15	0900EST 2100EST			0	0	2.5M	Hurricane	
		Hurricane Floyd - More than 50 homes damaged... 20 with structural, 30 with minor. One business with roof damage. Extensive beach							

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

FLORIDA, Northeastern

erosion. Storm surge deposited 3-4 feet of sand on CR-105 in Fernandina Beach.									
Duval County									
Jacksonville	15	2110EST			0	0	2.5K		Thunderstorm Wind
Large trees and power lines were blown down.									
Marion County									
Bellevue	27	1640EST			0	0	600K		Flood
		2200EST							
More than 8.5 inches of rainfall damaged 38 homes and 10 business.									
Marion County									
Countywide	27	1900EST			0	0	15K		Flood
Flooding continued to cause problems. Several homes behind the middle school were damaged.									

FLORIDA, Northwest

Calhoun County									
Altha	06	1530EST			0	0	1K		Thunderstorm Wind
Calhoun County S.O. reported large trees down at the intersection of Highways 275 and 71.									

FLORIDA, Southern

Collier County									
1 SW Naples	06	1100EST			0	0			Waterspout
A towboat operator reported a waterspout in the Gulf of Mexico near Coon Key.									
Palm Beach County									
Boca Raton	06	1610EST	0.5	10	0	0			Tornado (F0)
A tornado, that was photographed by a newspaper, touched down near Yamato Road and U.S. 441 causing no damage.									
Palm Beach County									
10 W West Palm Beach	06	1630EST			0	1	50K		Lightning
A 33-year old male was injured by lightning while standing in the bed of this tow truck. He was admitted to a hospital then released. Three houses suffered minor damage from lightning-initiated fires.									
Palm Beach County									
Boca Raton	07	1000EST			0	0			Funnel Cloud
Several funnel clouds were sighted.									
Dade County									
1 E Miami Beach	08	0925EST			0	0			Waterspout
The Miami Beach Beach Patrol sighted several waterspouts in the Atlantic between 6th and 10th streets.									
FLZ068-072-074	Coastal Palm Beach - Coastal Broward - Coastal Dade								
	13	1200EST			0	0	100K		Hurricane
	14	2300EST							
Large and powerful hurricane Floyd, approached the southeast Florida coast on September 13 and moved north of the area by September 15. Southeast Florida remained on the "weak" side of Floyd with minimal effects, mostly to marine interests. Total damage from Floyd in south Florida is estimated at \$100 thousand, most of which was in Palm Beach county. This figure does not include preparation costs which were estimated to have been near \$3 million in Palm Beach County alone.									
The observed maximum sustained wind on land was 37 mph with a gust to 56 mph at Lake Worth Pier with most areas reporting maximum sustained winds of 25 to 30 mph. The winds caused very minor damage, mainly to trees and some utility lines. Rainfall amounts were unusually light with less than one half inch reported at all official stations in south Florida.									
The storm surge ranged from 3.3 feet above normal in Palm Beach County to 1.5 feet above normal in Miami-Dade County. This caused mostly minor beach erosion. Some locally moderate to heavy beach erosion was reported, especially in areas that had experienced high water from hurricane Dennis, two weeks earlier. Other marine damage occurred to sea walls and small boats. One brief tornado touched down in Boca Raton causing no damage.									
Evacuation of tens-of -thousands of coastal residents was ordered. Shelters were opened, schools and most businesses closed and airports were shut down as Floyd approached.									
Palm Beach County									
Boca Raton	14	1849EST	0.1	7	0	0			Tornado (F0)
A brief tornado touched down near Glades Road and U.S. 441. doing no damage.									
Palm Beach County									
15 SE West Palm Beach	17	0715EST			0	0			Waterspout
Several waterspouts were sighted in the Atlantic.									
Dade County									
10 NW Homestead Afb	17	1315EST			0	0			Funnel Cloud
A funnel cloud was observed by Homestead Air Reserve Base personnel.									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------	---------------------------------	---------------------------------	-------	--------------------

FLORIDA, Southern

Palm Beach County

Jupiter **18** **1230EST** **0** **0** **1K** **Tstm Wind/Hail**
A power line was blown down by a thunderstorm wind gust.

Dade County

West Miami **20** **0410EST** **0.1** **5** **0** **0** **Tornado (F0)**
A brief tornado touched down near southwest 117 Avenue and 7th Street.

FLZ068>069-072-074

Coastal Palm Beach - Coastal Collier - Coastal Broward - Coastal Dade

20 **1200EST** **0** **0** **325K** **Tropical Storm**
21 **2200EST**

Tropical storm Harvey formed in the eastern Gulf of Mexico on September 19 and after moving toward west central Florida turned southeast and moved across the south Florida peninsula on September 21. As Harvey moved across south Florida it became poorly organized and exhibited characteristics of a frontal wave.

Total damage from Harvey in south Florida is estimated at \$350 thousand, mainly in Collier County. The observed maximum wind speed was 53 mph at Turkey Point Nuclear Power Plant in south Dade County with Fowey Rocks Light reporting sustained winds of 52 mph with a gust to 58 mph. Most areas of south Florida reported maximum sustained winds of 25 to 30 mph with gusts near 40 mph. The winds caused very minor damage, mainly to vegetation in the everglades.

Rainfall amounts were heaviest in Collier county with several reports of 10 inches in the Naples-Marco Island area which caused serious street flooding, but property damage was minimal. Rain estimates in mainland Monroe county were 6 to 10 inches. Rainfall in other areas of south Florida was 1 to 3 inches.

The maximum storm surge was estimated at 1 to 2 feet along the southwest Florida coast causing minor flooding at Everglades City and minor beach erosion in Collier and mainland Monroe counties. Two brief tornadoes touched down, one tearing the roof off of a residence in the Naples area.

Broward County

Sunrise Golf Vlg **20** **1610EST** **0** **0** **Funnel Cloud**
A funnel cloud was sighted near I-595 and Flamingo Road.

Collier County

Naples **20** **1620EST** **0.3** **10** **0** **0** **20K** **Tornado (F1)**
A tornado on the fringes of tropical storm Harvey tore the roof off a residence in the Paradise Point subdivision.

Collier County

Naples **20** **1900EST** **0** **0** **200K** **Flash Flood**
22 **1200EST**
Eight inches of rain fell during the afternoon of September 20 causing major street flooding which submerged six vehicles and caused minor flooding to 34 structures.

FLORIDA, West Central

Highlands County

Avon Park to **01** **1500EST** **0** **0** **50K** **0** **Urban/Sml Stream Fld**
Venus **1800EST**

Three to five inches of rain fell in less than three hours and caused localized flooding of homes, businesses and woodlands in low-lying areas along the U.S. Highway 27 corridor from Avon Park to Venus.

Lee County

Ft Myers **02** **1830EST** **0** **0** **0.50K** **0** **Lightning**
Lightning struck a flag pole which ignited and destroyed a large flag at an auto dealership near the intersection of Winkler Avenue and Fowler Street in Ft. Myers.

Pinellas County

Clearwater to **06** **0500EST** **0** **0** **50K** **0** **Urban/Sml Stream Fld**
St Petersburg **0800EST**

Four to six inches of rain in less than four hours caused localized flooding of low-lying streets and areas of poor drainage from Clearwater southeast to St Petersburg in Pinellas county. A few vehicles incurred water damage from flooded roadways in St Petersburg.

Citrus County

Crystal River to **06** **0600EST** **0** **0** **10K** **0** **Urban/Sml Stream Fld**
Chassahowitzka **0900EST**

Four to five inches of rain fell in less than three hours along the U.S. Highway 19 corridor from Crystal River south to Chassahowitzka in Citrus county. A few vehicles incurred water damage at low-lying intersections along U.S. Highway 19 in Crystal River.

Pinellas County

Largo to **07** **1400EST** **0** **0** **50K** **0** **Urban/Sml Stream Fld**
St Petersburg **1700EST**

Four to six inches of rain fell over previously saturated areas of Pinellas county and caused localized street flooding from Largo to St. Petersburg. A few vehicles along the U.S. Highway 19 corridor from Largo to St. Petersburg incurred water damage at low-lying

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

FLORIDA, West Central

intersections.

Pinellas County Seminole

07 1430EST **0 1 0 0 Lightning**
Lightning struck and caused facial injury to a teenage male standing alongside an automobile in Seminole.

Sarasota County Sarasota

08 0700EST **0 0 25K 0 Urban/Sml Stream Fld**
0900EST

Three to four inches of rain in less than two hours caused localized flooding of low-lying streets in Sarasota. Several vehicles incurred water damage from floodwaters near the intersection of U.S. Highway 41 and 301 in Sarasota.

Highlands County Sebring

11 1500EST **0 0 250K 0 Urban/Sml Stream Fld**
1900EST

Heavy rainfall of two to four inches in less than four hours caused localized flooding and ponding of water over already saturated soils of southwest Highlands county. At least 25 homes, many of them mobile, incurred water damage along the U.S. Highway 27 corridor from Venus to Sebring.

Hillsborough County Tampa to 12 NW Tampa

11 1700EST **0 0 20K 0 Urban/Sml Stream Fld**
2100EST

Four to six inches of rain fell in less than four hours and caused localized flooding of streets and roadways over low-lying areas of western Hillsborough county. A few vehicles and homes incurred water damage in the Town n' Country area of western Hillsborough county.

FLZ051>052-055>057- 060>062-065

Hillsborough - Polk - Manatee - Hardee - Highlands - Sarasota - De Soto - Charlotte - Lee

14 1200EST **0 0 20K 0 Hurricane**
1800EST

The outer rainbands of hurricane Floyd moved parallel to the east coast of Florida and produced tropical storm force wind gusts primarily across interior counties within West Central Florida. A maximum wind gust of 58 mph was reported at Lakeland Linder Airport around 1700 EST on the 14th.

Tropical storm force wind gusts uprooted a few large trees and downed power lines in and around Lakeland in Polk County. One mobile home lost its roof from tropical storm force winds on Rock Ridge Road in Lakeland.

Manatee County 7 SW Bradenton Beach

18 1700EST **0 0 0 0 Waterspout**

A waterspout was observed by the public southwest of Bradenton Beach in Manatee county.

Sarasota County 10 S Sarasota

18 1730EST **0 0 0 0 Waterspout**

Sarasota airport tower personnel reported a waterspout ten miles south of the Sarasota-Bradenton Airport.

FLZ039-042-049>051- 055-060>062-065

Levy - Citrus - Pasco - Pinellas - Hillsborough - Manatee - Sarasota - De Soto - Charlotte - Lee

20 2100EST **0 0 100K 0 Tropical Storm**
21 1200EST

Remnants of Tropical Storm Harvey moved parallel along the West Central coast of Florida and produced near tropical storm force wind gusts from Tampa south to Ft. Myers during the late evening of the 20th through the early morning hours of the 21st. Maximum observed wind gust observed along the West Central Florida coast was 36 mph in Sarasota at 2310 EST on the 20th.

Tropical Storm Harvey produced storm surges of one to two feet from Levy south to Sarasota county and two to three feet along the coast of Charlotte and Lee counties.

The minimum pressure observed along the West Central Florida coast was 1003.1 millibars.

Twenty-four hour rainfall amounts were generally under an inch with isolated amounts up to 2.5 inches. Greatest twenty-four hour rainfall observed along the West Central Florida coast was 2.41 inches at Page Field in Ft. Myers.

Minor beach erosion occurred from Siesta Key in Sarasota county south across Manasota Key in Charlotte county and continued to Sanibel Island in Lee county. Several hundred feet of Blind Pass Road along the extreme southern tip of Siesta Key was washed away by high waves and flood waters.

Lee County Bonita Spgs to Estero

21 0030EST **0 0 200K 0 Flood**
0900EST

Four to seven inches of rain fell over the previously saturated soil of southern Lee County and caused flooding of homes and businesses in low-lying areas along the U.S. Highway 41 corridor from Estero south to Bonita Springs.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

FLORIDA, West Central

Highlands County

Sebring to Venus 26 1000EST 1500EST 0 0 50K 0 Urban/Sml Stream Fld

Four to six inches of rain caused localized flooding of roadways and low-lying areas along the U.S. Highway 27 corridor from Sebring south to Venus. A few vehicles and homes incurred water damage from the floodwaters from Sebring to Venus.

Hernando County

Masaryktown to Brooksville 27 1730EST 1845EST 0 0 10K 0 Urban/Sml Stream Fld

Five to six inches of rain in less than two hours caused minor to moderate street flooding along the U.S. Highway 41 corridor from Brooksville to Masaryktown. One home incurred flood damage and localized ponding of water, up to two feet in depth, occurred in a construction zone near Powell.

Polk County

Bartow to Frostproof 30 1900EST 2100EST 0 0 25K 0 Urban/Sml Stream Fld

Four to six inches of rain caused localized flooding of roadways and low-lying areas from Bartow to Frostproof in Polk county. A few vehicles and homes in low-lying areas incurred water damage from the floodwaters in Bartow.

FLORIDA, West Panhandle

Escambia County

Pensacola Beach 20 0630CST 0700CST 0 0 Coastal Flooding

Minor coastal flooding was reported along the west end of State Highway 399 near Fort Pickens. Two inches of water was reported in the street but vehicles were still able to drive through without any trouble. The high water occurred around high tide and quickly went down as the tide fell. The tide gage near downtown Pensacola reported a height of 2.61 feet around the time of flooding.

GEORGIA, East Central

Burke County

Countywide 15 1400EST 0 0 0 Thunderstorm Wind (G50)

EPD reported scattered trees and powerlines down.

GEORGIA, Lower

Jeff Davis County

Snipesville 06 1440EST 0 0 Hail (0.88)

Charlton County

Folkston 07 1638EST 0 0 2.5K Thunderstorm Wind

Large trees and power lines were blown down.

Ware County

Waycross 07 1645EST 0 0 3.5K Thunderstorm Wind

Large trees and power lines were blown down.

GEORGIA, North and Central

Coweta County

Sharpsburg 07 1410EST 0 0 5K Lightning

A house was struck by lightning.

Coweta County

Sharpsburg 07 1415EST 0 0 Hail (0.75)

The public reported 3/4 inch hail.

Coweta County

Thomas Xrds to Newnan 07 1455EST 1500EST 0 0 Hail (1.75)

The public reported dime to golf ball size hail.

Laurens County

Dublin to East Dublin 07 1455EST 1504EST 0 0 Hail (1.75)

Laurens county 911 reported golf ball size hail.

Laurens County

Dublin to East Dublin 07 1455EST 1504EST 0 0 50K Thunderstorm Wind

Laurens county 911 and newspaper accounts reported thunderstorm winds knocked trees and power lines down, and caused roof damage to some buildings. Underpinnings were blown from mobile homes in the St Charles area. There was also damage to one wall of a fire station. Two center pivot irrigation systems on U.S. 80 east of town were turned upside down and destroyed.

Laurens County

East Dublin 07 1500EST 0 0 50K Lightning

A newspaper reported lightning started a fire at a house on Ferry Street, causing heavy damage.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

September 1999

GEORGIA, North and Central

Cobb County Marietta

21 1300EST 0 0 100K **Lightning**
A lightning strike caused a house fire at 2842 Meadowgrove Way in Marietta. The home was pretty much a total loss.

Cobb County Kennesaw to 8 E Marietta

21 1310EST 0 0 **Hail (1.00)**
1330EST
A CNN meteorologist and several public reports indicated dime to quarter size hail fell across Cobb county. The meteorologist said quarter size hail covered the ground in Marietta.

Cobb County Marietta

21 1310EST 0 0 0.50K **Thunderstorm Wind (G68)**
1316EST
A CNN meteorologist reported a 78 mph gust using a hand-held anemometer. The wind blew over a 14 inch diameter oak tree.

Gwinnett County Lilburn

21 1313EST 0 0 **Hail (1.75)**
1320EST
Two public reports indicated dime and golf ball size hail.

Fulton County Sandy Spgs to 2 E Sandy Spgs

21 1330EST 0 0 **Hail (1.25)**
1345EST
Several public reports indicated dime to half dollar size hail fell in the Sandy Springs area of north Fulton county. Hail covered the ground in some areas.

De Kalb County Dunwoody

21 1340EST 0 0 **Hail (1.00)**
1350EST
Three public reports indicated dime to quarter size hail.

De Kalb County Dunwoody

21 1345EST 0 0 0.50K **Thunderstorm Wind**
Public reports indicated thunderstorm winds knocked several trees down in the vicinity of Peachtree-Dunwoody Road and I-285.

Gwinnett County Norcross

21 1345EST 0 0 **Hail (0.75)**

Gwinnett County Norcross

21 1345EST 0 0 0.50K **Thunderstorm Wind**
A citizen reported dime size hail and several trees down.

Fulton County College Park to Union City

21 1410EST 0 0 **Hail (0.75)**
1420EST
The public reported dime size hail at a Hartsfield Airport parking lot. Another citizen reported numerous limbs down and power outages in Union City.

Barrow County Winder

21 1415EST 0 0 **Hail (1.00)**
The public reported quarter size hail.

Barrow County Statham

21 1440EST 0 0 2.5K **Thunderstorm Wind**
The public reported trees down all around Statham. One fell on a mobile home.

Bibb County Macon

21 1650EST 0 0 50K **Lightning**
Lightning sparked a fire that caused damage to the attic of a house at Walnut and New streets which had been converted into 2 businesses.

GEORGIA, Northeast

GAZ010-017>018-026-028>029 Rabun - Habersham - Stephens - Franklin - Hart - Elbert

01 0000EST 0 0 **Drought**
30 2359EST
Rainfall continued to be scarce during the month of September, prolonging the drought conditions which existed all summer. More wells ran dry and many more areas began mandatory water restrictions.

Hart County Vanna

09 1400EST 0 0 **Hail (0.75)**

Hart County Vanna

09 1400EST 0 0 **Thunderstorm Wind (G50)**
A severe thunderstorm produced large hail as well as damaging wind which downed trees and power lines.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

GEORGIA, Northeast

GAZ010

Rabun

15 2000EST

0

0

High Wind (G40)

16 1100EST

A tight pressure gradient between powerful Hurricane Floyd across eastern North Carolina and strong high pressure over the Ohio Valley and Great Lakes pulled cooler and very dry air south across the mountains of extreme northeast Georgia on strong north winds. Numerous trees and power lines were blown down, some on homes and vehicles due to winds sustained as high as 45 mph.

GEORGIA, Southeast

**GAZ087>088-099>101-
114>119-137>141**

Jenkins - Screven - Candler - Bulloch - Effingham - Tattnall - Evans - Inland Bryan - Coastal Bryan - Inland Chatham - Coastal Chatham - Long - Inland Liberty - Coastal Liberty - Inland McIntosh - Coastal McIntosh

01 0000EST

0

0

Drought

30 2359EST

Severe drought conditions continued over much of southeast Georgia with a rainfall deficit of over 10 inches in some places.

Effingham County

**Guyton to
Rincon**

07 1650EST

0

0

Thunderstorm Wind (G50)

1700EST

Trees and power lines down.

**GAZ087>088-099>101-
114>119-137>141**

Jenkins - Screven - Candler - Bulloch - Effingham - Tattnall - Evans - Inland Bryan - Coastal Bryan - Inland Chatham - Coastal Chatham - Long - Inland Liberty - Coastal Liberty - Inland McIntosh - Coastal McIntosh

15 1200EST

0

0

Hurricane

2300EST

Hurricane Floyd approached from the south, but turned more northeast on the afternoon of the 15th and just brushed southeast Georgia. Well over 200,000 citizens in the affected counties evacuated the area. Because Floyd turned to the northeast, damage was minimal and confined mostly to the coastal counties. Scattered trees and a few power lines were down. Highest winds over land was 40 mph with a gust to 53 mph at the Savannah Airport. Maximum tide at Savannah was 12.39 ASL (8.69 MLLW) with a maximum departure of 3.3 feet.

Chatham County

**5 W Savannah to
Savannah**

29 1930EST

0

1

Thunderstorm Wind (G50)

Numerous trees and power lines down. One mobile home destroyed 5 miles west of Savannah near U.S. 17 and Highway 307.

GEORGIA, Southwest

Dougherty County

Pecan City

07 1340EST

0

0

2K

Thunderstorm Wind

Dougherty County S.O. reported downed trees and scattered power outages.

Worth County

Countywide

07 1400EST

0

0

8K

Thunderstorm Wind

1415EST

Worth County 911 dispatcher reported downed trees and scattered power outages.

GEORGIA, West Central

NONE REPORTED.

HAWAII

HIZ003-007>008

Maui - West Hawaii Including Leeward Kohala And Kona - South Hawaii Including Kau

01 0000HST

0

0

Drought

30 2359HST

September marked another month of continuous trade winds across the Hawaiian Islands. Rain bands embedded within the trade flow provided light to moderate rainfall almost daily over windward areas of the state. A few areas along the leeward sides of the islands of Maui and Hawaii received sufficient rainfall to push September's totals to close to normal. However, year-to-date deficits in these areas remained substantial.

Maui County

A few areas of Upcountry Maui did see some drought relief during September, though not nearly enough to make up for almost two years of below average rainfall. The gage at Ulupalakua, located in one of the areas hardest hit by the drought, saw 2.19 inches in September (81 percent of average), of which 1.41 inches fell in a six-hour period during the afternoon of 2 September. These showers did not reach the Kula gage, which remained dry the entire month (0.19 of an inch, 10 percent of average). Central valley sites were also very dry, with totals less than 20 percent of average at Wailuku, Waikapu Country Club, and Kahului Airport. Due to its exposure to trade wind showers, the gage at Hana was the highest rainfall total (3.04 inches, 54 percent of average) for Maui County.

Island of Hawaii

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

HAWAII

Trade wind showers brought September rainfall totals of four to eight inches for the gages in the Hamakua, Hilo, and Puna sections of the island. These totals were between 50 to 90 percent of average. Afternoon showers along the slopes of the North Kona District helped produce near average totals at Waiaha (6.43 inches, 104 percent of average) and Kainaliu Upper (7.54 inches, 94 percent of average). For the gage at Kainaliu Upper, 7.54 inches was the highest total received since September 1997 (8.04 inches). Dry conditions persisted over portions of the South Kohala and Kau Districts. The gage at Kamakoa saw only 0.09 of an inch (22 percent of average). For the year-to-date numbers, Kamakoa's total was only 1.71 inches, or 14 percent of average. Both Kau sites, Kapapala and Pahala, remained very dry with totals on 22 and 34 percent of average.

The following list contains rainfall statistics for selected locations from around the state. The first column is the observed rainfall for September. The second column is the 30-year average for that location, while the third column lists the percent of average rainfall for September. The fourth and fifth columns are the year-to-date total and the year-to-date percent of average, respectively.

	Sep 99	Avg.	%Avg.	YTD	YTD %Avg.
Maui					
Kahului Airport	0.03	0.4	8	6.92	50
Hana	3.04	5.4	56	N/A	N/A
Haiku	1.05	3.0	35	N/A	N/A
Kihei	0.23	0.2	115	2.54	24
Lahainaluna	0.13	0.6	22	4.29	32
Wailuku	0.10	0.6	17	7.92	41
Island of Hawaii					
Hilo Airport	5.65	8.5	66	87.82	94
Pahala	1.14	3.4	34	13.58	34
Honaunau	6.22	7.2	86	21.62	41
Kamuela (Upper)	1.74	2.3	76	44.88	104
Glenwood	7.97	8.9	90	148.81	124
Laupahoehoe	4.36	6.9	63	76.33	68

Rainfall had eased the drought in some parts of Maui and the Big Island. However, some macadamia nut producers continued to feel its effects. Sotero Agoot, manager of the Kona Pacific Farmers Cooperative in Napoopoo, said the drought had contributed to a macadamia nut output decline of about 10 percent for 1999. Also, drought conditions were responsible for increasing fire danger on the Island of Hawaii. By the end of September, officials had decided to close part of the Mauna Kea Forest Reserve and the Kahoe Game Management Area because lack of rainfall had dried vegetation to hazardous levels. Portions of the forest reserve below 10,000 feet elevation that lie between Kemole Gulch on the northwest slope and Waikahalulu Gulch in the south, all of the Kaohe Game Management Area, and nearby roads were to be closed.

HIZ001>003-005>008

Kauai - Oahu - Maui - Molokai - Lanai - West Hawaii Including Leeward Kohala And Kona - South Hawaii Including Kau

01 0000HST 0 0 High Surf
03 0800HST

A deep storm low east of New Zealand generated surf of 4 to 8 feet along the south shores of all the Hawaiian Islands.

Maui County
14 N Lahaina

12 0931HST 0 0 Funnel Cloud
0935HST

A funnel cloud was observed over water 8 miles north of the Kapalua-West Maui Airport, or about 14 miles north of Lahaina.

Hawaii County
3 NW Kailua Kona

20 1530HST 0 0 Waterspout
1535HST

A waterspout was spotted northwest of Kailua Kona, in Honokohau Bay. No injuries or damage were reported.

Honolulu County
6 SSW Nanakuli

26 1750HST 0 0 Funnel Cloud
1755HST

A funnel cloud was sighted west of Ko Olina Beach in west Oahu, or about 6 miles south/southwest of Nanakuli.

IDAHO, Extreme Southeast

NONE REPORTED.

IDAHO, North

NONE REPORTED.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

IDAHO, Northwest

IDZ002>003

Coeur D'Alene Area - Idaho Palouse

25 0800PST 0 0 30K High Wind
1800PST

Winds of 20-40 mph with gusts of 50-70 mph buffeted portions of North Idaho. Several trees were reported down along with numerous power lines causing power outages.

IDAHO, Southeast

**Bonneville County
5 N Idaho Falls**

18 1630MST 0 0 4K Thunderstorm Wind (G54)
1700MST

Thunderstorm induced winds broke power poles and lines, and downed numerous trees. A downed power line caused a fire that destroyed a billboard.

IDZ020>021

Upper Snake River Plain - Lower Snake River Plain

25 1100MST 0 0 50K High Wind (G58)
1900MST

A high wind event in the wake of a cold front brought sustained winds of 40 knots (reported at Pocatello airport) with gusts to 58 knots across the Snake River plains. The winds dropped numerous trees and branches throughout the area, some of which fell onto power lines or vehicles. Widespread power outages were reported. Several radio stations were knocked off the air. A traffic light fell onto a truck. A downed power line caused a fire that destroyed a potato storage shed worth \$1000. Debris cleanup from the storm was predicted to take three weeks.

IDAHO, Southwest

NONE REPORTED.

ILLINOIS, Central

**Vermilion County
1 N Rossville**

28 1618CST 0 0 0 Thunderstorm Wind
1621CST

Microburst winds from a severe thunderstorm moved through an area just north of Rossville. The winds blew down several trees and numerous tree limbs. One tree split in half. One half of the tree fell onto a house causing minor damage. An old barn nearby was blown down. No injuries were reported and no damage estimate was available.

ILLINOIS, Northeast

NONE REPORTED.

ILLINOIS, Northwest

**Bureau County
Depue**

27 1530CST 0 0 15K Lightning

Lightning was blamed for a blaze which partially damaged a hog confinement building. Lightning struck the building and blew a hole in the propane gas line, igniting the fire. Approximately 50 feet on the south side of the building was damaged while some sheeting on the roof buckled under the intense heat from the blaze. The building housed 500 hogs, none of which were injured or killed.

ILLINOIS, South

ILZ075>078-080>094

Jefferson - Wayne - Edwards - Wabash - Perry - Franklin - Hamilton - White - Jackson - Williamson - Saline - Gallatin - Union - Johnson - Pope - Hardin - Alexander - Pulaski - Massac

01 0001CST 0 0 Drought
30 2359CST

The moderate to severe summer drought took a considerable toll on crops across southern Illinois. The worst drought conditions were along the Ohio River, where Paducah, KY, received only 1.5 inches of rain in the three-month period from July to September. Carbondale received much more generous rainfall, with a three-month total of 5.5 inches. The soybean crop suffered the greatest effects from the drought, with yields in most areas only near 20 percent of normal. Corn yields were much closer to normal due to plentiful rains in June and early July, when the corn crop matures most rapidly. Small ponds and reservoirs became very low. The city of Marion, which relies on a small lake for its drinking water supply, was forced to siphon water from its neighboring city of Herrin. Low water levels in Union and Jackson Counties forced some cattle farmers to haul water to their herds. The fire danger reached extreme levels at times. The Illinois Department of Natural Resources issued a wildfire alert for southern Illinois due to the combination of drying grasses, brisk winds, and low humidity. Outdoor burning was banned in seven counties, including Alexander, Pope, Johnson, Jackson, Union, Pulaski, and Hardin. Local burning bans were posted in other counties. Among the many wildland fires that occurred, one of the largest was near West Frankfort, where 80 acres were scorched. River levels on the Ohio River became unsafe for navigation in places. Fully loaded barges could not safely navigate the river, so tonnage was reduced by 10 to 20 percent.

ILLINOIS, Southwest

NONE REPORTED.

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
INDIANA, Central									
Warren County Pine Vlg	28	1805EST 1807EST			0	0			Thunderstorm Wind (G50)
Tippecanoe County Montmorencie to Klondyke	28	1820EST 1825EST			0	0	10K		Thunderstorm Wind (G90)
Tippecanoe County Lafayette to 5 E Buck Creek	28	1823EST 1855EST			0	0	100K		Hail (1.75)
Tippecanoe County Buck Creek	28	1845EST 1847EST			0	0			Thunderstorm Wind (G56)
Tippecanoe County Battle Ground to 3.8 SE Battle Ground	28	1854EST 1900EST	3.8	900	0	1	300K		Tornado (F1)
Carroll County Radnor to Flora	28	1905EST 1925EST			0	0			Hail (1.75)
Carroll County Radnor	28	1905EST 1907EST			0	0	10K		Thunderstorm Wind (G56)
<p>A squall line moved across the northwestern portions of the IND CWA producing large hail, damaging winds and an F1 tornado. The damage occurred in the vicinity of a well-defined bow echo. Damage began across northeastern sections of Warren county as numerous trees were reported down at Pine Village at 605 pm est. The severe weather then spread across northern Tippecanoe county. Trees were reported down at Montmorencie, West Lafayette and Klondyke, where a wind gusts of 103 mph was measured. By the time the storm reached Lafayette, golfball size hail was reported. Golfball size hail reports continued as the storm moved across Buck Creek. In addition, a trained spotter reported estimated wind gusts at 65 to 70 mph. An F1 tornado touched down at Battleground just to the north of the bow apex of the squall line cutting almost a 4 mile long and 1/2 mile wide path. 3 tool barns were destroyed and a 5th wheel camper was overturned injuring one person. Also, a Ford Taurus was crushed by a fallen tree. At least 2 dozen structures received minor damage. In addition, there were numerous fallen trees facing various directions and siding from various houses was found thrown in the trees. Most of the damage was along Huston Road and state road 225. Hail damage was extensive from Battle Ground to Buck Creek. Many houses had numerous golfball size holes in the siding from the hail being thrown at such high speeds. The thunderstorm moved into southern Carroll county just after 700 pm est and continued to produce golfball size hail from Radnor to Flora. In addition, a barn was destroyed in Radnor.</p>									
INDIANA, Northeast									
Cass County 7 NW Logansport	28	1520EST			0	0	0		Thunderstorm Wind
Several trees blown down.									
Fulton County 4 W Fulton	28	1537EST			0	0	25K		Thunderstorm Wind
Many trees blown down. Several homes sustained minor to moderate damage from fallen tree limbs.									
Fulton County 4 E Fulton	28	1550EST			0	0	100K		Thunderstorm Wind
This storm intially developed over white county and intensified as it moved rapidly northeast eventually becoming supercellular across southwestern Fulton county. Initially the public reported a tornado in the Nyona lake area but it was later confirmed by a NWS storm survey team that a microburst had occurred in that area from 2 miles north of the lake to 1 mile south. Numerous trees had limbs broken off and several large pine trees were snapped off taking down many power lines. Extensive damage also occurred to three homes and at least two vehicles from fallen trees. Additionally three boats on the lake were flipped over.									
Miami County Macy	28	1600EST			0	0	10K		Thunderstorm Wind
Several trees and power lines blown down.									
Whitley County 4 E South Whitley	28	1630EST			0	0	0		Thunderstorm Wind
A few tree limbs and one tree were blown down.									
Whitley County 4 E South Whitley	28	1630EST			0	0			Thunderstorm Wind (G57)
Whitley County Columbia City	28	1652EST			0	0			Thunderstorm Wind (G61)
Whitley County Columbia City	28	1652EST			0	0	50K		Thunderstorm Wind
Several trees were blown down with many tree limbs down on houses. Extensive damage also occurred to power lines throughout the city with some residents going without power for the entire night.									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

INDIANA, Northeast

Whitley County Churubusco	28	1702EST			0	0			Hail (0.75)
De Kalb County Auburn	28	1725EST			0	0	0		Thunderstorm Wind
Two trees were reported blown down.									
Allen County 2 W Huntertown	28	1734EST			0	0	0		Thunderstorm Wind
A few trees were reported blown down.									
White County 2 S Brookston	28	1845EST			0	0			Hail (1.00)
Isolated supercell thunderstorms developed along a prefrontal boundary the afternoon of the 28th. The strongest storm initiated over White county around 3:00 pm EST and tracked rapidly northeast at 30 knots. This storm was responsible for producing several microbursts as well as dropping torrential rain and small hail throughout its lifetime before it finally dissipated as it crossed the Indiana/Ohio state line that evening. In some places... the hail accumulated several inches deep. The hardest hit areas were across central into eastern Fulton county, especially the Nyona lake area and in Columbia City. Crop losses were likely high especially to the soybean crop but no dollar estimates were available for this storm.									

INDIANA, Northwest

NONE REPORTED.

INDIANA, South Central

Crawford County Taswell	08	1700EST			0	0			Thunderstorm Wind (G50)
Several trees down									

INDIANA, Southeast

NONE REPORTED.

INDIANA, Southwest

INZ081>082-085>088 Gibson - Pike - Posey - Vanderburgh - Warrick - Spencer	01	0001CST			0	0			Drought
	30	2359CST							
The moderate summer drought took a considerable toll on crops across Southwest Indiana. Rainfall at Evansville for the three-month period from July through September was about 3 inches. This compares to a 3-month average of around 10 inches. Evansville received 0.39 inches in September, which was 3 inches below normal. The soybean crop suffered the greatest effects from the drought, with average yields estimated only about 20 percent of normal. Corn yields were much closer to normal, mainly due to heavy rains in June and early July, when the corn crop matures. The fire danger reached extreme levels at times. The governor of Indiana declared a total burning ban across all of Southwest Indiana. A wildland fire in mid-September scorched several hundred acres near Chandler, which is in Warrick County. A field fire early in the month occurred near Evansville at the junction of Interstate 164 and U.S. Highway 41. Although no evacuations were required, the westbound lanes of Interstate 164 were closed briefly due to smoke. A wildfire on September 27 burned about 150 acres just west of Owensville in Gibson County. Fire departments from throughout Gibson County and parts of Posey County worked to extinguish this fire.									
Spencer County Santa Claus	08	1635CST			0	0	2K		Thunderstorm Wind (G52)
Thunderstorm wind gusts estimated near 60 MPH downed numerous small branches.									

IOWA, Central

Kossuth County 2 N Algona	07	1600CST			0	0	5K	10K	Hail (1.75)
Kossuth County 2 N Algona	07	1612CST			0	0	5K	5K	Hail (1.75)
Hancock County 3 W Woden	07	1645CST			0	0	5K	10K	Hail (1.75)
Hancock County 4 SW Woden	07	1648CST			0	0	2K	5K	Hail (1.00)
Pocahontas County Pocahontas	07	1757CST			0	0	15K	5K	Hail (1.75)
Kossuth County Titonka	07	1822CST			0	0	3K	5K	Hail (1.00)

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

IOWA, Central

Taylor County 3 NW Gravity	07	1830CST 1835CST	0.7	30	0	0		2K	Tornado (F0)
Kossuth County 3 N Wesley	07	1844CST			0	0		5K	Hail (0.75)
Carroll County Glidden	07	1900CST			0	0	15K		Thunderstorm Wind (G56)
Webster County Roelyn	07	1900CST			0	0	440K	230K	Thunderstorm Wind (G78)
Humboldt County Humboldt	07	1904CST			0	0		5K	Hail (0.88)
Adams County Corning	07	2000CST			0	0	10K	5K	Hail (1.50)

The seasons first dynamic cold front moved southeast into Iowa during the evening hours of the 7th. Temperatures warmed rapidly during the day on a gusty south wind. Readings topped out in the mid 80s to low 90s across the state. Dew point temperatures climbed into the mid 60s to low 70s across the region by the late afternoon. These conditions combined to produce surface based CAPE values of 3500 to 4500 J/kg ahead of the front. A narrow line of thunderstorms developed just ahead of the cold front during the late afternoon hours. The environment became favourable for severe thunderstorm development as mid level winds were increasing and had increased to 50 to 60 kts before sunset. The storms became severe and produced hail at several locations from north central into southwest Iowa. The largest hail was golf ball in size and fell in the north central part of the state. Gusty winds were also common with the storms, though most of the storms only produced winds around 50 MPH. One of the storms produced very high winds in Webster County from what appeared to be a downburst. Winds around 90 MPH flattened crops in a 5 square mile area. One farmstead was hit with damage reported there including a grain dryer toppled. In addition, a grain dryer was toppled at the cooperative, costing between \$300,000 and \$400,000. The storms weakened a few hours after sunset with no severe weather reported by the late evening hours. During the early evening as the line of storms moved through southwest Iowa, hail nearly golf ball in size fell in Adams County. A tornado touched down in Taylor County, briefly, northwest of Gravity. The only damage was crop damage as it was over open country.

IAZ004>007-015>017-023>028-033>039-044>050-057>062-070>075-081>086-092>097	Emmet - Kossuth - Winnebago - Worth - Palo Alto - Hancock - Cerro Gordo - Pocahontas - Humboldt - Wright - Franklin - Butler - Bremer - Sac - Calhoun - Webster - Hamilton - Hardin - Grundy - Black Hawk - Crawford - Carroll - Greene - Boone - Story - Marshall - Tama - Audubon - Guthrie - Dallas - Polk - Jasper - Poweshiek - Cass - Adair - Madison - Warren - Marion - Mahaska - Adams - Union - Clarke - Lucas - Monroe - Wapello - Taylor - Ringgold - Decatur - Wayne - Appanoose - Davis								
	21	0100CST 0700CST			0	0		15.0M	Extreme Cold

The second major push of cold air of the season moved into Iowa as the seasons first real Arctic high pressure moved into the central U.S. As skies cleared during the evening of the 20th, temperatures fell quite rapidly. Though this was the third time frost occurred in the state, it was the first time temperatures fell below 32 degrees. Readings fell into the mid to upper 20s over much of northern Iowa, and parts of central Iowa, with low 30s over the rest of the state. Several record low temperatures for the date were set as this was one of the earliest occurrences of 32 degrees or lower on record. Crops were about 80% mature at the time of the frost, which limited damage. Visual inspection on the afternoon of the 21st indicated that the frost had indeed caused significant plant damage to crops that had not yet reached maturity. Damage was estimated at about \$15,000,000 across the state.

IOWA, East Central and Southeast

Jefferson County Packwood	03	1400CST			0	0			Thunderstorm Wind (G60)
			Thunderstorm winds damaged an outdoor shed.						
Iowa County 1 W Parnell	03	1910CST			0	0			Hail (0.75)
Clinton County 4 N Dewitt	19	1517CST			0	0			Hail (0.75)

IOWA, Northeast

NONE REPORTED.

IOWA, Northwest

Woodbury County Sioux City	01	0500CST			0	0	5K		Lightning
			Lightning struck a transformer, damaging it and dropping a power line across a highway. Power loss occurred for about one thousand customers for up to 3 hours.						

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>IOWA, Southwest</u>									
Pottawattamie County									
5 SSW Treynor	07	1620CST			0	0			Hail (0.75)
Mills County									
Emerson	07	1649CST			0	0			Hail (0.75)
Montgomery County									
2 NE Wales	07	1715CST			0	0			Hail (0.75)
Montgomery County									
Elliott	07	1805CST			0	0			Hail (0.88)
Pottawattamie County									
13 SE Oakland	07	1805CST			0	0			Hail (0.75)
Page County									
4 NE Hepburn	07	1902CST			0	0			Hail (1.00)
Pottawattamie County									
2 NE Oakland	07	1935CST			0	0			Hail (0.75)
Mills County									
2 SSE Henderson	07	1940CST			0	0			Hail (1.00)
Montgomery County									
2 W Wales	07	2000CST			0	0			Hail (0.75)
Montgomery County									
4 NW Villisca	07	2030CST			0	0			Hail (1.75)
<u>KANSAS, East</u>									
Douglas County									
Baldwin	04	1330CST			0	0			Lightning
									Lightning struck a power line knocking out power to Baldwin City for about 10 hours.
Ottawa County									
Ada	04	1600CST			0	0	3K		Lightning
									Lightning struck a house near Ada starting a fire which did minor damage.
Washington County									
Hanover	04	2330CST			0	0	3K		Lightning
									Lightning struck a residence and did minor damage.
Dickinson County									
Abilene	10	0800CST			0	0	25K		Lightning
									Lightning struck a city dispatch center in Abilene doing about 25 thousand dollars damage.
Republic County									
Agenda	04	1635CST			0	0			Hail (0.88)
Jefferson County									
Valley Falls	07	1520CST			0	0	2K		Thunderstorm Wind (G50)
									Strong winds damaged several outbuildings.
Douglas County									
1 S Baldwin	07	1610CST			0	0			Hail (1.25)
Riley County									
2 NW Manhattan	07	1818CST			0	0			Hail (1.25)
Lyon County									
Americus	26	2143CST			0	0			Hail (0.75)
Lyon County									
Americus	26	2150CST			0	0			Hail (0.75)
Lyon County									
Admire	26	2208CST			0	0			Hail (0.75)
Lyon County									
Admire	26	2211CST			0	0			Hail (1.75)
Osage County									
5 S Barclay	26	2243CST			0	0			Hail (0.75)
Shawnee County									
3 E Silver Lake	26	2300CST			0	0	40K		Lightning
									Severe thunderstorms developed over east-central Kansas the evening of the 26th and produced several reports of large hail. Lightning also struck a house near Silver Lake and ignited a fire that destroyed the residence.
<u>KANSAS, Extreme Southeast</u>									
Crawford County									
Walnut	04	1410CST			0	0	4K		Thunderstorm Wind
									A thunderstorm downed a power pole and produced 1 inch hail.

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated		September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm	
<u>KANSAS, Extreme Southeast</u>										
Crawford County										
Arma	04	1500CST			0	0	3K		Thunderstorm Wind	
		Thunderstorm winds downed power lines.								
Cherokee County										
1 SW Columbus	04	1745CST			0	0	3K		Thunderstorm Wind	
		Thunderstorm winds downed power lines.								
<u>KANSAS, North Central</u>										
Jewell County										
2 S Burr Oak	07	1759CST			0	0	0	0	Hail (2.00)	
Jewell County										
Ionia	07	1824CST			0	0	0	0	Hail (1.75)	
		One to two inch diameter hail fell and covered the ground for a time just south of Burr Oak.								
Osborne County										
16 S Osborne	14	0827CST			0	0	0	0	Hail (0.88)	
<u>KANSAS, Northeast</u>										
Linn County										
Parker	07	1615CST 1700CST			0	0			Thunderstorm Wind (G50)	
		Downed trees were reported near Parker.								
Miami County										
3 SE Paola	07	1619CST			0	0			Thunderstorm Wind (G60)	
		The Miami County Sheriff's Department estimated wind gusts at 70 mph.								
Wyandotte County										
Kansas City	07	1704CST 1707CST			0	0			Hail (1.00)	
		Multiple reports of dime to quarter size hail were received from the Kansas City Fire Department.								
KSZ060										
		Linn								
	29	0000CST			0	0			Flood	
	30	0000CST								
		The month of September came to a wet end across extreme eastern Kansas. Rainfall of over 4 inches on the 27th and 28th caused minor river flooding on the Marais des Cygnes near LaCygne.								
<u>KANSAS, Northwest</u>										
Graham County										
Hill City Arpt	03	1555CST			0	0			Thunderstorm Wind (G55)	
Graham County										
12 N Hill City	03	1623CST			0	0			Hail (0.75)	
Norton County										
11 E Norton	03	1624CST			0	0			Thunderstorm Wind (G53)	
Greeley County										
5 S Tribune	06	1620MST			0	0			Hail (0.75)	
Rawlins County										
Herndon	11	1350CST			0	0			Hail (1.75)	
Decatur County										
11 NW Oberlin	11	1412CST			0	0			Hail (1.75)	
Greeley County										
8 N Tribune	11	1430MST			0	0			Hail (0.75)	
Decatur County										
9 SW Oberlin	11	1512CST			0	0			Hail (0.75)	
Logan County										
3 S Winona	11	1523CST			0	0			Hail (1.00)	
Logan County										
10 SSW Monument	11	1540CST			0	0			Hail (0.88)	
Decatur County										
10 E Dresden	11	1605CST			0	0			Hail (1.00)	
Norton County										
New Almelo	11	1615CST			0	0			Hail (0.75)	
Logan County										
10 S Oakley	11	1620CST			0	0			Hail (1.50)	

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>KANSAS, Northwest</u>									
Sheridan County									
4 N Tasco	11	1628CST			0	0			Hail (0.75)
<u>KANSAS, Southeast</u>									
Ellsworth County									
10 NE Ellsworth	04	1520CST			0	0			Hail (0.75)
Saline County									
Brookville	04	1619CST			0	0			Hail (1.00)
Ellsworth County									
Kanapolis Res	04	1800CST			0	0			Hail (0.75)
Harper County									
6 SW Attica	07	0830CST			0	0			Thunderstorm Wind (G52)
		Numerous tree limbs blown down.							
Reno County									
2 N Hutchinson	07	1050CST			0	0			Hail (0.88)
Reno County									
Hutchinson	07	1055CST			0	0			Thunderstorm Wind (G56)
		Major tree damage with several uprooted and limbs 3-4 inches in diameter blown down.							
Greenwood County									
2 N Eureka	07	1415CST			0	0			Hail (0.75)
Marion County									
Marion	07	1419CST			0	0			Thunderstorm Wind (G52)
		Numerous trees and power lines blown down.							
Harper County									
2 W Attica to Attica	07	1447CST 1515CST			0	0			Hail (1.75)
Woodson County									
Yates Center	07	1508CST			0	0			Thunderstorm Wind (G52)
		Numerous tree limbs blown down.							
Greenwood County									
Fall River Res	07	1510CST			0	0			Hail (0.75)
Sedgwick County									
Clearwater	07	1514CST 1518CST			0	1	500K		Hail (2.50)
		Quarter to tennisball-sized hail pummeled Clearwater, breaking windows and inflicting widespread damage to roofs and vehicles. One tennisball-sized hailstone struck a man in the head rendering him unconscious.							
Butler County									
1 NW Cassoday	07	1532CST			0	0			Hail (0.75)
Sedgwick County									
Colwich	07	1550CST 1557CST			0	0			Hail (1.75)
		Quarter to golfball-sized hail pelted Colwich.							
Greenwood County									
2 N Eureka	07	1608CST			0	0			Hail (0.88)
Sedgwick County									
2 SW Peck	07	1614CST 1615CST			0	0			Hail (1.50)
		Penny to walnut-sized hail landed 2 miles southwest of Peck.							
Sumner County									
Caldwell	07	1622CST			0	0			Hail (0.75)
Sumner County									
Belle Plaine	07	1631CST	0.5	110	0	0			Tornado (F0)
		Reported by train engineer and relayed by Weatherdata.							
Sedgwick County									
Wichita	07	1635CST 1638CST			0	0			Hail (1.75)
		Quarter to golfball-sized hail occurred at intersection of I-235 and K-96.							
Sedgwick County									
Bentley	07	1638CST 1640CST			0	0			Hail (1.75)
		Also reported by KSNW Channel 3.							

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	Character of Storm	
<u>KANSAS, Southeast</u>									
Sedgwick County 1 NW Wichita	07	1646CST			0	0		Hail (1.75)	
Occurred at intersection of I-235 and Meridian in North Wichita.									
Greenwood County Eureka	07	1647CST			0	0		Hail (1.75)	
Greenwood County Eureka	07	1647CST			0	0		Thunderstorm Wind (G52)	
Trees and power lines blown down across Highway 54.									
Harper County 5 SW Anthony	07	1647CST			0	0		Thunderstorm Wind (G52)	
Sedgwick County Wichita	07	1658CST			0	0		Hail (0.75)	
Occurred at intersection of Central and Webb in northeast Wichita.									
Sedgwick County Wichita	07	1658CST			0	0		Hail (0.88)	
Occurred at I-135/Kellogg overpass.									
Sedgwick County Wichita	07	1702CST			0	0		Hail (1.00)	
Occurred at KSNW Channel 3 television station.									
Sedgwick County 5 NW Andale	07	1707CST			0	0		Hail (0.75)	
Harper County 4 E Waldron	07	1721CST			0	0		Hail (0.75)	
Harper County 4 E Waldron	07	1721CST			0	0		Thunderstorm Wind (G52)	
Numerous tree limbs blown down.									
Kingman County Penalosa	07	1824CST			0	0		Hail (1.75)	
Kingman County 2 SW Spivey	07	2022CST			0	0		Hail (1.00)	
Chase County 5 SE Hymer	07	2336CST			0	0		Hail (0.75)	
Barton County Pawnee Rock	11	1959CST			0	0		Thunderstorm Wind (G56)	
Trees, 12 to 15 inches in diameter, blown down.									
Reno County 1 S Darlow	26	1750CST			0	0		Hail (0.75)	
Reno County 1 E Haven to 2 E Haven	26	1822CST 1827CST	1	110	0	0		Tornado (F0)	
Also reported by general public as relayed by KWCH Channel 12.									
Reno County Haven	26	1902CST			0	0		Hail (0.75)	
Sedgwick County 2 NW Andale	26	1923CST			0	0		Hail (0.75)	
Reno County 5 SE Haven	26	1933CST			0	0		Hail (0.75)	
Sedgwick County Colwich	26	1946CST			0	0		Hail (1.00)	
KSZ083 Countywide	26 27	2015CST 0600CST			0	0		Flood	
Slow-moving severe thunderstorms drenched Sedgwick County, and the Wichita metropolitan area in particular, with record-setting rainfalls (2.29 inches in 30 minutes, 3.85 inches in 1 hour, 4.89 inches in 2 hours, and 5.63 inches in 3 hours at Wichita's Mid-Continent Airport). The deluge induced flooding on area creeks and streams, most notably the Cowskin Creek and resulted in \$xxx damage.									
Kingman County 5 N Norwich	26	2029CST			0	0		Hail (0.75)	
Sedgwick County Cheney	26	2032CST			0	0		Hail (1.00)	
Sedgwick County 4 N Viola	26	2108CST			0	0		Thunderstorm Wind (G56)	
Large tree limbs blown down.									

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property	Crops	Character of Storm
<u>KANSAS, Southeast</u>									
Sedgwick County									
Clearwater	26	2124CST			0	0			Hail (0.88)
			Hailstone diameters ranged from 0.75-0.88 inch. reports also received from amateur radio operators.						
Sedgwick County									
Clearwater to	26	2140CST			0	0			Hail (1.25)
1 W Clearwater									
			Hailstone diameters ranged from 1.00-1.25 inches.						
Sumner County									
1 N Milton	26	2205CST			0	0			Hail (1.00)
Sumner County									
Caldwell	26	2243CST			0	0			Hail (1.75)
Sedgwick County									
Wichita	26	2319CST			0	0			Hail (1.75)
Sedgwick County									
2 E Goddard	26	2330CST			0	0			Hail (1.75)
Sedgwick County									
Wichita	26	2353CST			0	0			Hail (0.75)
			Occurred at Mid-Continent Airport.						
Sedgwick County									
Wichita	27	0005CST			0	0			Hail (0.75)
			Reported at Pawnee/West Street intersection.						
<u>KANSAS, Southwest</u>									
Ellis County									
9 W Hays	03	1620CST			0	0			Thunderstorm Wind (G56)
Kiowa County									
6 S Greensburg	03	1625CST			0	0			Thunderstorm Wind (G59)
Hamilton County									
20 NW Syracuse	03	1700CST			0	0			Thunderstorm Wind (G56)
Barber County									
2 NW Sharon	07	1510CST			0	0			Hail (1.25)
			Hail covered the ground.						
Edwards County									
5 SW Lewis	10	1320CST			0	0			Hail (1.00)
Edwards County									
5 S Lewis	10	1330CST			0	0			Hail (0.75)
Edwards County									
12 SSW Belpre	10	1415CST			0	0			Hail (0.88)
Edwards County									
2 S Trousdale	10	1430CST			0	0			Hail (0.75)
Pratt County									
2 N Cullison	10	1448CST			0	0			Hail (1.25)
Pratt County									
2 N Cullison	10	1455CST			0	0			Hail (0.75)
Pratt County									
2 N Cullison	10	1456CST			0	0			Hail (1.25)
Pratt County									
4 W Pratt	10	1505CST			0	0			Hail (0.75)
Scott County									
13 N Scott City	11	1640CST			0	0			Hail (1.00)
Hamilton County									
Syracuse	11	1705CST			0	0			Hail (1.00)
Hamilton County									
Syracuse	11	1705CST			0	0			Thunderstorm Wind (G52)
Kearny County									
16 NW Lakin	11	1707CST			0	0			Hail (0.75)
Hamilton County									
21 NW Syracuse	11	1715CST			0	0			Hail (0.75)
Kearny County									
17 SW Lakin to 16 SW Lakin	11	1718CST			0	0			Thunderstorm Wind (G53)

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>KANSAS, Southwest</u>									
Kearny County									
15 SW Lakin	11	1735CST			0	0			Hail (1.25)
Grant County									
8 NE Ulysses	11	1755CST			0	0			Thunderstorm Wind (G61)
Finney County									
6 SSW Garden City	11	1810CST			0	0			Hail (0.75)
Grant County									
13 SE Ulysses	11	1835CST			0	0			Thunderstorm Wind (G52)
Haskell County									
8 N Sublette	11	1900CST			0	0			Thunderstorm Wind (G52)
Haskell County									
3 WSW Satanta	11	1910CST			0	0			Thunderstorm Wind (G52)
Seward County									
16 NNW Liberal	11	1910CST			0	0			Thunderstorm Wind (G56)
		Five to six inch tree limbs down.							
Haskell County									
9 SE Sublette	11	1925CST			0	0			Thunderstorm Wind (G69)
		80 MPH wind blew 4 inch limbs down.							
Meade County									
20 NW Meade	11	1925CST			0	0			Hail (0.75)
Meade County									
20 NW Meade	11	1925CST			0	0			Thunderstorm Wind (G52)
		Two inch limbs down.							
Seward County									
2 N Liberal	11	1950CST			0	0			Hail (0.75)
Pawnee County									
6 NE Larned	11	2015CST			0	0			Thunderstorm Wind (G52)
		Two inch diameter limbs down and shed door blown off.							
Meade County									
Meade	11	2045CST			0	0			Thunderstorm Wind (G56)
Stevens County									
6 SW Moscow	11	2050CST			0	0			Hail (0.75)
Meade County									
16 S Meade	11	2055CST			0	0			Thunderstorm Wind (G52)
		Two inch diameter limbs down.							
Seward County									
13 NNW Liberal	11	2251CST			0	0			Hail (0.75)
Stevens County									
7 NW Hugoton	11	2305CST			0	0			Hail (1.00)
Stevens County									
Moscow	11	2308CST			0	0			Flash Flood
		Water was reported over several roads.							
Stevens County									
1 E Woods	11	2326CST			0	0			Hail (2.00)
Meade County									
13 SSW Meade	12	0000CST			0	0			Hail (0.75)
Morton County									
2 N Rolla	12	0000CST			0	0			Hail (1.00)
Seward County									
Liberal	12	0100CST			0	0			Flash Flood
		Intersection of Highways 54 and 83 was closed due to flooding.							
Kearny County									
15 SW Lakin	14	0320CST			0	0			Hail (1.00)
Grant County									
3 NE Columbian Carbor	14	0520CST			0	0			Hail (0.75)
Gray County									
2 E Copeland	14	0520CST			0	0			Hail (1.75)
Gray County									
4 NE Copeland	14	0520CST			0	0			Hail (1.00)
Meade County									
20 SE Meade	14	0810CST			0	0			Hail (0.75)

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<u>KANSAS, Southwest</u>									
Kiowa County Mullinville	14	1230CST			0	0			Hail (1.00)
Kiowa County Mullinville	14	1239CST			0	0			Hail (1.00)
<u>KENTUCKY, Central</u>									
Harrison County Broadwell	08	2145EST			0	0			Thunderstorm Wind (G50)
Several trees and power lines down									
<u>KENTUCKY, Eastern</u>									
NONE REPORTED.									
<u>KENTUCKY, Northeast</u>									
KYZ101>103-105	Greenup - Carter - Boyd - Lawrence								
01	0000EST				0	0			Drought
30	2300EST								
The drought severity increased again during September for Northeast Kentucky. Total monthly rains were mostly less than an inch. For example, Grayson reported only around 7 tenths. A fire ban was issued for Carter County.									
<u>KENTUCKY, Northern</u>									
NONE REPORTED.									
<u>KENTUCKY, Southwest</u>									
KYZ001>022	Fulton - Hickman - Carlisle - Ballard - Mcracken - Graves - Livingston - Marshall - Calloway - Crittenden - Lyon - Trigg - Caldwell - Union - Webster - Hopkins - Christian - Henderson - Daviess - Mclean - Muhlenberg - Todd								
01	0001CST				0	0		154M	Drought
30	2359CST								
The severe summer drought took a major toll on crops and plants across West Kentucky. Rainfall at Paducah for the three-month period from July through September was about an inch and a half. This compares to a 3-month average of around 10 inches. Paducah received 0.66 inches in September, which was 3 inches below normal. The soybean crop sustained the greatest monetary losses, estimated near 70 million dollars. This was followed by tobacco losses near 50 million, and corn near 35 million. Total crop losses in western Kentucky were near 155 million dollars, which prompted an agricultural disaster declaration by the state and federal governments. The root systems of many shrubs and young trees were damaged by the drought. Some shrubs and shallow-rooted trees, such as dogwood and redbud trees, died during the summer. The unirrigated pumpkin crop was nearly a total loss. The fire danger reached extreme levels at times. A few of the largest fires reached 500 to 1000 acres in size. The largest fire occurred east of Central City in Muhlenberg County late in the month. This fire grew to almost 1000 acres, prompting the closure of the Western Kentucky Parkway for several hours. Another large fire, estimated around 500 acres, occurred in Hickman County early in the month. This fire, which may have been sparked by a passing train, burned quite a few corn and soybean fields. Finally, a 100-acre cornfield fire near Henderson closed the Pennyriple Parkway for about an hour and forced the brief evacuation of a nursing home. Burning bans were imposed in virtually all western Kentucky counties, including a campfire ban in the Land Between The Lakes National Recreation Area. The Kentucky Division of Water declared a Water Shortage Warning for the Pennyriple area, which includes the Owensboro and Hopkinsville areas. However, no mandatory water conservation measures were imposed. A secondary effect of the drought was premature leaf-drop, which reduced the brilliance of the fall colors. River levels on the Ohio River became unsafe for navigation in places. Fully loaded barges could not safely navigate the river, so tonnage was reduced by 10 to 20 percent.									
<u>LOUISIANA, Northeast</u>									
NONE REPORTED.									
<u>LOUISIANA, Northwest</u>									
Lincoln Parish 8 E Dubach	02	1450CST			0	0	5K		Lightning
Culbertson water well hit by lightning burning one of the motors in the well system. This left some 850 customers without water for a period.									
Claiborne Parish Lake Claiborne	05	1650CST			0	0			Hail (0.75)
Claiborne Parish Lake Claiborne	05	1655CST			0	0			Thunderstorm Wind (G52)
Trees and powerlines down.									

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>LOUISIANA, Northwest</u>									
Claiborne Parish									
Lake Claiborne	05	1655CST			0	0	35K		Thunderstorm Wind (G75)
									Trailer house turned over. Minor damage to the marina and roof damage to one house.
Claiborne Parish									
Lake Claiborne	05	1711CST			0	0			Hail (0.75)
									Hail covered the ground.
Union Parish									
5 N Bernice	05	1740CST			0	0			Thunderstorm Wind (G52)
									Several large trees down.
Union Parish									
10 NW Farmerville	05	1755CST			0	0			Thunderstorm Wind (G55)
									Several large trees down across Hwy 15.
Union Parish									
Bernice	05	1900CST			0	0	150K		Lightning
									A fire, ignited by lightning, swept through a church, gutting the building. The church, a venerable landmark in Union Parish, was declared a total loss. Included as a part of the church were Sunday school classrooms, dining area and church sanctuary.
Bossier Parish									
2 S Haughton	07	1700CST			0	0	40K		Thunderstorm Wind (G70)
									Mobile home lifted and thrown 30 feet from its foundation and totalled. Home was anchored with eight tie-down straps including two which went over the trailer. The anchors were pulled out of the ground. Also, several roofs and vehicles were damaged and numerous trees were either snapped or pulled out of the ground.
<u>LOUISIANA, Southeast</u>									
West Baton Rouge Parish									
Brusly to	01	1240CST			0	0	2K		Thunderstorm Wind
2 NW Brusly									Thunderstorm winds blew down a large commercial sign at a fast food restaurant in Brusly and knocked down two trees 2 miles northwest of Brusly.
St. Tammany Parish									
3 N Covington	06	1515CST			0	0	0.25K		Thunderstorm Wind
									Several trees were uprooted along Lee Road.
St. Tammany Parish									
6 NE Covington	06	1522CST			0	0	0.25K		Thunderstorm Wind
									Several large pine trees were uprooted near Highway 59 and Longleaf Drive.
Orleans Parish									
Algiers	06	1915CST			0	0	50K		Lightning
									A lightning strike caused a fire that extensively damaged two units of an apartment complex.
St. James Parish									
Gramercy	07	1425CST			0	0			Thunderstorm Wind (G50)
									A wind gust of 62 mph was reported by the St. James Parish Office of Emergency Management.
Terrebonne Parish									
Houma	08	1300CST			0	0	500K		Lightning
									A lightning strike set off a fire involving nine tanks of an oil and salt water mixture at the Houma Salt Water Disposal Facility. The fire consumed an estimated 26,460 gallons of crude oil.
<u>LOUISIANA, Southwest</u>									
Vermilion Parish									
1 SW Gueydan	06	1700CST			0	0	50K		Thunderstorm Wind
									Powerful winds blew the roof off of one home and carried it half a mile. Several telephone poles were broken. Four people in the home were uninjured after they sought shelter in the hallway.
St. Landry Parish									
1 SW Port Barre	07	1456CST	0.1	10	0	0			Tornado (F0)
		1457CST							A small tornado briefly touched down in a field southwest of Port Barre, causing no damage.
Acadia Parish									
Maxie	07	1610CST			0	0			Hail (0.75)
Allen Parish									
Kinder	08	1540CST			0	0	2K		Thunderstorm Wind
									Trees were blown down.
Beauregard Parish									
Longville	08	1620CST			0	0			Thunderstorm Wind (G52)
									Sheriff Deputy reported 60 mph wind gusts.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

LOUISIANA, Southwest

Calcasieu Parish

Gillis 08 1640CST 0 0 Hail (0.88)

MAINE, North

MEZ001>002-
004>006-010>011-
015>017-029>030

Northwest Aroostook - Northeast Aroostook - Northern Piscataquis - Northern Penobscot - Southeast Aroostook - Southern Piscataquis - Central Penobscot - Southern Penobscot - Interior Hancock - Interior Washington - Coastal Hancock - Coastal Washington

16 0800EST 0 0 High Wind (G35)
18 0800EST

The remnants of Hurricane Floyd brought gusty winds and heavy rains to Northern and Eastern Maine. Wind gusts of 30 to 40 mph were common across the region...with locally stronger winds over the higher terrain of Baxter State Park.

Many tree limbs were snapped off across the region...some of which brought down power lines causing scattered power outages. Several reports of downed trees were received...mainly in the vicinity of Baxter State Park. The stronger winds over the higher terrain of this region and nearly saturated ground contributed to the blow downs.

Rainfall totals of 3 to 5 inches were associated with the remnants of Floyd. This was on top of 2 to 4 inches of rain which had fallen across Northern Maine less than a week before in association with the remnants of Hurricane Dennis. This combination of rains produced high water levels on area rivers and streams. Although water levels were high...rivers and streams across the region generally remained within their banks. Standing water was reported on a few roads which passed through low lying swampy areas and some basements needed to be pumped.

MAINE, South

MEZ007>009-
012>014-018>028

Northern Oxford - Northern Franklin - Central Somerset - Southern Oxford - Southern Franklin - Southern Somerset - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo

10 0900EST 0 0 Heavy Rainfall
11 0600EST

Heavy rains developed over the entire state as a southeast flow of tropical moisture developed ahead of an approaching cold front. Rainfall amounts generally ranged from 2 to 4 1/2 inches statewide with less than an inch in the downeast area. Gorham reported the greatest rainfall amount with 5.9 inches. The heavy rains came as a relief to the many people who had been suffering through a drought that had plagued southern and western sections of the state since April.

MEZ007>009-
012>014-018>029

Northern Oxford - Northern Franklin - Central Somerset - Southern Oxford - Southern Franklin - Southern Somerset - Interior York - Interior Cumberland - Androscoggin - Kennebec - Interior Waldo - Coastal York - Coastal Cumberland - Sagadahoc - Lincoln - Knox - Coastal Waldo - Coastal Hancock

16 1600EST Remnants Of Floyd
18 0400EST

Cumberland County Countywide

17 0100EST 0 0 200K Flood
2100EST

Franklin County Countywide

17 0100EST 0 0 Flood
1700EST

Oxford County Countywide

17 0100EST 0 0 178.4K Flood
1700EST

MEZ012-014-020>021-
024 Southern Oxford - Southern Somerset - Androscoggin - Kennebec - Coastal Cumberland

17 0145EST 0 0 Flood
19 0330EST

Androscoggin County Countywide

17 0500EST 0 0 138.6K Flood
18 1100EST

Kennebec County Countywide

17 1100EST 0 0 125K Flood
18 1100EST

Somerset County Countywide

17 1100EST 0 0 250K Flood
18 1100EST

A southeast flow of tropical moisture developed over Maine late Wednesday, September 15 as Hurricane Floyd moved slowly northeastward along the East Coast of the United States. The rains became heavier on Thursday and Thursday night as the remnants of Floyd moved toward and into northern New England. By Friday morning, the remnants of Floyd were centered over southwestern Maine. During Friday, the remnants of Floyd moved east-northeastward through southern Maine, and then into the Canadian

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

MAINE, South

maritimes by Saturday morning. As the storm moved to the northeast Friday, precipitation tapered to scattered showers in the southwestern part of the state, however, a steady, moderate to heavy rain continued in the western foothills and mountains. The heavy rains associated with Floyd caused small rivers and streams to rise over their banks and numerous roads were damaged by runoff. Strong winds accompanied the storm and then increased again on the back side of the storm during the day on Friday as high pressure pushed into the area. The strong winds knocked tree limbs onto power lines causing power outages which affected about 15,000 customers. Some of the stronger wind gusts reported in the state included 47 mph in Sanford; 39 mph in Portland; 38 mph in Augusta; and 36 mph in Lewiston and Waterville.

Rainfall totals generally ranged from about 4 to 7 inches over much of the state, with some locally higher amounts. Much of Androscoggin County received between 7 and 8 inches of rain, with Poland reporting 8.72 inches of rain from the event. Other rainfall totals included 5.50 inches in Bethel, in Oxford County; 6.71 inches in Augusta, in Kennebec County; and 5.58 inches in Skowhegan, in Somerset County.

Minor flooding occurred along the Androscoggin, Presumpscot, Kennebec, and upper Saco Rivers. The Presumpscot at Westbrook was above the 15 ft flood stage from 2:45 am EDT to 11:30 pm on the 17th, cresting at 18.32 ft at 11:00 am. The Androscoggin River at Rumford was in flood from 3:30 pm on the 17th until 8:15 am on the 18th, reaching a crest of 16 ft (1 ft above flood stage) at 11 pm on the 17th. At Auburn, the Androscoggin River was above flood stage from 12:15 am on the 18th until 4:30 am on the 19th, reaching a crest of 14.01 ft at 6:45 pm on the 18th, about 1 foot above flood stage. The Kennebec River was in flood from 1:30 am on the 18th until 6:15 pm on the 18th, reaching a crest of 13.8 ft (0.8 ft above flood stage) at 11:15 am on the 18th. In Skowhegan, the Kennebec River had flood flows from 12:00 pm on the 17th until 1:00 am on the 19th, reaching a maximum flow rate of 45,211 cfs at 7:00 am on the 18th. Flood flow in Skowhegan is 35,000 cfs.

MARYLAND, Central

MDZ002>007-
009>011-013>014-
016>018

Allegany - Washington - Frederick - Carroll - Northern Baltimore - Harford - Montgomery - Howard - Southern Baltimore - Prince Georges - Anne Arundel - Charles - St. Mary'S - Calvert

01	0000EST	0	0	Drought
30	2359EST			

Rainfall from two land falling hurricanes made a tremendous impact on the drought that plagued the region since the summer of 1998. Most of the rain from these systems fell east of Frederick with the highest amounts near the Chesapeake Bay. The water shortage came to an end by mid month in all but Allegany and Washington Counties. By the 30th, conditions in Western Maryland were upgraded from an extreme to moderate drought, and were near normal or slightly wet elsewhere. Baltimore/Washington International Airport (BWI) reported a monthly rainfall total of 11.50 inches, 8.09 inches above normal. It was the 2nd wettest September on record. The Maryland Science Center in downtown Baltimore reported a total of 10.83 inches. Other September rainfall totals included Anne Arundel County at 12.5 inches, Prince Georges County at 11.5 inches, St. Mary's County at 11.2 inches, Montgomery County at 10.9 inches, Carroll County at 10.1 inches, Charles County at 10.0 inches, Howard County at 9.9 inches, Frederick County at 8.7 inches, Washington County at 8.4 inches, and Allegany County at 4.1 inches.

The much needed rainfall affected rivers and water reservoirs dramatically. Carroll County reported a 2.5 foot jump in the groundwater level during September. The governor of Maryland lifted mandatory water restrictions statewide during the first week of the month. The ban on open burning was lifted for all but Western Maryland as well. However, effects of the drought still lingered in the agricultural community. The drought cost Maryland farmers over \$75 million. Across the state by the end of the month, 41% of corn, 17% of soybeans, 13% of sorghum, and 14% of pasture land were still in poor or very poor condition. Farmers reported 33% of subsoil moisture and 11% of topsoil was still short or very short of moisture. The average pumpkin in the fall harvest was on average 3 to 5 pounds smaller than normal. Also, the city of Baltimore reported losing 300 street trees to the drought, and Howard County reported the loss of 165 trees.

Anne Arundel County

North Portion	05	0200EST	0	0	Heavy Rain
	06	1000EST			

Baltimore City (C)

Baltimore	05	0200EST	0	1	Heavy Rain
	06	1000EST			

13 year old boy rescued from swollen Jones Falls

Frederick County

Countywide	05	0200EST	0	0	Heavy Rain
	06	1000EST			

Howard County

Countywide	05	0200EST	0	0	Heavy Rain
	06	1000EST			

Montgomery County

Countywide	05	0200EST	0	0	Heavy Rain
	06	1000EST			

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999		
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm	
MARYLAND, Central										
Prince George'S County										
Countywide	05	0200EST			0	0			Heavy Rain	
	06	1000EST								
Anne Arundel County										
East Portion	05	0300EST			0	0			Storm Surge	
	06	2000EST								
parking lot on Dock Street in Annapolis flooded; roads near bay under water										
Baltimore City (C)										
Baltimore	05	0300EST			0	0			Storm Surge	
	06	2000EST								
Water rose over seawall onto the Harbor Place promenade at Inner Harbor										
Calvert County										
East Portion	05	0300EST			0	0			Storm Surge	
	06	2000EST								
Halloween Point, Cove Point, and Chesapeake Beach flooded										
Allegany County										
Frostburg	05	1300EST			0	0	5K		Lightning	
Power poles downed after being hit by lightning										
The remnants of Hurricane Dennis moved across Maryland from late on the 4th through midday on the 6th. Its legacy included heavy rain, especially across Central Maryland, power outages from fallen tree limbs, and tidal flooding along the western shoreline of the Chesapeake Bay. Tides were 2 to 3 feet above normal along the shoreline of Calvert and Anne Arundel Counties. Several locations next to the water were flooded at high tide, including a parking lot on Dock Street in Annapolis and Halloween Point, North Beach, and Cove Point in Calvert County. Chesapeake Beach in Calvert County also reported 2 feet of water over 9th Street and minor damage to 2 businesses. In Baltimore, the persistent east to southeast wind pushed water over the seawall at Inner Harbor and onto the Harbor Place promenade.										
Heavy rain also caused several problems in the region. Two days of rain made Jones Falls Creek in Baltimore swell, and a 13 year old boy floating down the creek in a makeshift raft was washed downstream. It took an hour for a team of 30 fire fighters to rescue him from a pile of debris snagged by a pillar of a bridge supporting the Jones Falls Expressway. The child was treated for hypothermia. Several other communities including Bowley's Quarters near Middle River and Oella near the Patapsco River reported street flooding. In Howard County, Route 1 at Elkridge was closed for a time on the 5th by 2 feet of water. Rainfall totals from Dennis across Central Maryland included 5.59 inches at Clarksburg, 4.50 inches at Glenmont, 4.41 inches at Gaithersburg, 4.05 inches at Rivera Beach, 3.96 inches at Damascus, 3.84 inches at Rockville, 3.77 inches at Laurel, 3.5 inches at Silver Spring, 3.47 inches at Oxon Hill, 3.30 inches at Thurmont, 3.04 inches at Dawsonville, 2.90 inches at Cooksville, 2.70 inches at Hipsley Mill, 2.52 inches at Baltimore/Washington International Airport (BWI), 2.33 inches at Inner Harbor in Baltimore, and 1.68 inches at Waldorf. In West Central Maryland, 2.46 inches fell at Sharpsburg, 2.45 inches fell at Williamsport, and 2.25 inches fell at Frostburg.										
Winds gusting to 35 MPH downed tree limbs onto power lines on the afternoon of the 5th, causing scattered power outages. Nearly 2000 customers in Central Maryland lost power. Lightning also downed two main power poles near Frostburg in Allegany County on the 5th, causing 4700 customers to lose power. The poles were downed at the intersection of Interstate 68 and Route 36, and crews had to shut down Interstate 68 between midnight and 6 AM on the 6th to repair them.										
Montgomery County										
Gaithersburg	07	1900EST			0	0			Heavy Rain	
		2100EST								
Streets flooded										
Frederick County										
South Portion	07	1920EST			0	0	3K		Thunderstorm Wind	
		1940EST								
Trees downed across roads										
Montgomery County										
Gaithersburg	07	1945EST			0	0	3K		Thunderstorm Wind	
Trees downed onto power lines										
Just a few days after Hurricane Dennis dropped heavy rain over North Central Maryland, another area of thunderstorms moved across the area producing winds in excess of 55 MPH, frequent lightning, and very heavy downpours. The storms affected the area between 8:00 PM and 10:00 PM EDT. High winds downed trees in Frederick and Montgomery Counties. Winds gusted to 50 MPH in Mt. Airy and 0.91 inches of rain fell in 20 minutes. Heavy downpours produced minor street flooding in Gaithersburg around 9:00 PM EDT. Power outages were also reported.										
Baltimore County										
West Portion	09	1645EST			0	0			Flash Flood	
		2000EST								
Flooding along Jones Creek; roads under water										

Storm Data and Unusual Weather Phenomena

September 1999								
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Character of Storm
MARYLAND, Central								
Baltimore City (C) Baltimore	09	1645EST 2000EST			0	0		Flash Flood
		Flooding downtown						
Baltimore City (C) Baltimore	09	1645EST 2000EST			0	0	5K	Thunderstorm Wind
		Trees and power lines downed						
Howard County Columbia to Dorsey	09	1645EST			0	0	3K	Thunderstorm Wind
		Trees and power lines downed						
Howard County Countywide	09	1730EST 2100EST			0	0		Flash Flood
		Flooding in Ellicot City, Dorsey, Columbia, and Elkridge						
Montgomery County Countywide	09	2000EST 2300EST			0	0		Flash Flood
		Streets flooded, Rock Creek and Sligo Creek out of their banks						
Prince George'S County Laurel	09	2000EST 2200EST			0	0		Heavy Rain
		Over 3.5 inches of rain at Patuxent River Filtration Plant Another round of thunderstorms producing damaging winds and very heavy rainfall moved across Central Maryland between 5:30 PM and 11:00 PM EDT. Several locations reported flooding and downed trees and power lines. In Montgomery County, Sligo Creek along Colesville Road, and Rock Creek went out of their banks. East-West Highway and Beach Drive flooded and a nearby recreational center had to be evacuated. Streets were flooded in Kensington, and a water rescue was reported in Chevy Chase. In Prince Georges County, the Patuxent River Water Filtration Plant at Laurel recorded a total of 3.55 inches of rain. In Howard County, many roads and creeks were flooded in Columbia, Ellicot City, and Elkridge. On Highway 1 between Highway 100 and Montgomery Road, many portions of the roadway were flooded and cars were stalled in hood-high water. A few homes near the community of Dorsey were surrounded by water. Winds also gusted between 50 and 60 MPH in Columbia and Dorsey, knocking down trees and power lines and sending 15,000 county residents into the dark. Rainfall amounts included 7.39 inches just north of Columbia and 5.98 inches just west of Elkridge. In Baltimore County, Jones Creek went out of its banks, and roads were flooded in downtown Baltimore. One location in the Baltimore area received 3.6 inches of rain in 1 hour and 20 minutes. Winds gusting between 50 and 60 MPH also downed trees and power lines in Baltimore, resulting in 23,000 electrical outages.						
Frederick County Countywide	16	0000EST 1400EST			0	0		Heavy Rain
		Small streams flooded secondary roads						
Montgomery County Countywide	16	0000EST 1400EST			0	0		Heavy Rain
		Streets flooded						
Baltimore County Southeast Portion	16	0200EST 2000EST			0	0		Storm Surge
		Tides 2 feet above normal						
Baltimore City (C) Baltimore	16	0200EST 2000EST			0	0		Storm Surge
		Tide 2 feet above normal						
Calvert County East Portion	16	0200EST 2000EST			0	0		Storm Surge
		Tides 2 to 3 feet above normal						
Harford County South Portion	16	0200EST 2000EST			0	0		Storm Surge
		Tides 2 to 3 feet above normal						

Storm Data and Unusual Weather Phenomena

September 1999

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Injured	Estimated Damage Property	Crops	Character of Storm
<u>MARYLAND, Central</u>									
St. Mary'S County									
East Portion	16	0200EST 2000EST			0	0			Storm Surge
			Tides 2 to 3 feet above normal, St. George's Island causeway flooded						
Anne Arundel County									
Countywide	16	0800EST 1800EST			0	0	2M		Flash Flood
			Over 1000 homes reported flood damage, over 100 roads closed, 2 water rescues						
Baltimore County									
Countywide	16	0800EST 1800EST			0	0	10K		Flash Flood
			7 swift water rescues, flooded roads						
Baltimore City (C)									
Countywide	16	0800EST 1800EST			0	0	50K		Flash Flood
			Jones Falls and Western Run overflowed, nearby residents evacuated						
Calvert County									
Countywide	16	0800EST 1800EST			0	0	500K		Flash Flood
			Roads and homes flooded						
Charles County									
Countywide	16	0800EST 1800EST			0	0			Flash Flood
			20 roads closed by high water						
Harford County									
Countywide	16	0800EST 1800EST			0	15	2.6M		Flash Flood
			High water closed 557 roads, 40 bridges washed out; 15 injuries						
MDZ003>006-009>010			Washington - Frederick - Carroll - Northern Baltimore - Montgomery - Howard						
	16	0800EST 2300EST			0	0	547K		High Wind
MDZ007-011-013>014-016>018			Harford - Southern Baltimore - Prince Georges - Anne Arundel - Charles - St. Mary'S - Calvert						
	16	0800EST 2300EST			0	0	900K		Tropical Storm
Prince George'S County									
Countywide	16	0800EST 1800EST			0	1			Flash Flood
			Boy rescued from drainage ditch; 15 county roads closed by high water						
St. Mary'S County									
Countywide	16	0800EST 1800EST			0	0	500K		Flash Flood
			26 people rescued from high water, many streams including St. Mary's River overflowed						
Carroll County									
Countywide	16	1100EST 1800EST			0	0			Flash Flood
			10 roads closed by high water						
Howard County									
Countywide	16	1100EST 1800EST			0	0			Flash Flood
			10 water rescues from flooded roadways						
			Hurricane Floyd made landfall just east of Cape Fear, North Carolina in the early morning hours of the 16th and moved north-northeast across extreme southeast Virginia to near Ocean City, Maryland by evening on the 16th. Rainbands on the outer edge of the hurricane began to affect Maryland east of Washington County shortly after 8:00 AM EDT on the 15th and continued to cross the area through afternoon on the 16th. The eye of Hurricane Floyd passed east of the Chesapeake Bay between 9:00 AM and midnight on the 16th. Gusty winds of 30 to 50 MPH blew across the area between 11:00 AM and midnight on the 16th, with localized wind gusts over 50 MPH near the Chesapeake Bay. Hundreds of trees and power lines were downed and over 500,000 customers lost electricity. A total of 2 to 5 inches of rain fell in Frederick, Carroll, Montgomery, and Howard Counties. A total of 5 to 8 inches fell across Baltimore, Prince George's, and Charles Counties. Between 8 and 12 inches fell across St. Mary's, Anne Arundel, and Harford Counties. The amount of damage Anne Arundel, Calvert, Charles, Harford, and St. Mary's Counties received from the storm qualified them for FEMA disaster assistance.						

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of Persons	Estimated Damage	September 1999		
		Local/ Standard	Length (Miles)	Width (Yards)			Property	Crops	Character of Storm

MARYLAND, Central

Tidal flooding was reported along the Chesapeake Bay. Strong southerly winds ahead of the hurricane pushed tides 2 to 3 feet above normal, flooding several low lying areas in St. Mary's, Calvert, Harford, and Anne Arundel Counties. Erosion was reported on the South River and Broad Creek. High water destroyed 5 homes, caused major damage to 23 homes, and minor damage to 1000 homes in the eastern portion of Anne Arundel County. In Calvert County, numerous shoreline homes between 2 and 4 feet above sea level were flooded. In St. Mary's County, the only causeway to St. George Island went underwater, trapping a half dozen residents. Tropical downpours also led to flooding. The highest rainfall reports included 11.60 inches in Annapolis, 11.11 inches in Ridge, 11.10 inches at Cape St. Claire in Anne Arundel County, 9.76 inches in California, 9.67 inches in Hollywood, 9.52 inches at Brown Landfill in Prince George's County, 8.64 inches in Bel Air, 8.62 inches at Fort McHenry, 8.30 inches in Pasadena, 8.27 inches in La Plata, 8.07 inches at Jug Bay Wetlands in Anne Arundel County, 7.82 inches in Tall Timbers, 7.78 inches in South Bowie, 7.25 inches in Millersville, 7.00 inches in Camp Springs, 6.96 inches in Marlboro, 6.83 inches in Morganza, 6.75 inches in Bowie, 6.13 inches in Brooklyn Park, 5.92 inches at Perry Hall, 5.78 inches at Baltimore/Washington International Airport, 5.33 inches in College Park, 5.26 inches in Bryans Road, 5.25 inches in Parkton, 5.19 inches at Inner Harbor Baltimore, 5.18 inches in Orville, 5.16 inches at Lake Roland in Baltimore County, 5.12 inches in Elkridge, 5.10 inches in Millers, and 5.04 inches in Ellicott City.

In St. Mary's County, high winds blew a cross bar off a church steeple and knocked out power to 5000 customers. Winds gusted to 71 MPH at Tall Timbers, 43 MPH at St. Indigoes, and 45 MPH at Hollywood. A wind gust of 65 MPH was recorded at Patuxent River Naval Air Station at 11:45 AM EDT. One location reported 10.6 inches of rain between 6 AM and 4 PM EDT on the 16th. County officials rescued 28 people by boat from a trailer park, homes, and stranded cars after the St. Mary's River and other waterways flooded. Nine other people were rescued from an apartment building near Great Mills. In Charles County, over 20 roads were closed by flooding. Several trees and power lines were downed, resulting in 5000 power outages. In Waldorf, a wind gust of 54 MPH downed a tree onto a home. In Calvert County, hundreds of large trees were downed onto roads, homes, and power lines. Over 11,000 electrical outages were reported. Winds gusted to 69 MPH at Mid Bay buoy offshore of Calvert Cliffs. A wind survey showed ribbons of tree damage from microburst winds estimated between 70 and 80 MPH. In Prince George's County, road crews cleared 500 trees from roadways. More than 60,000 customers lost power. Two people were injured and one person was killed by carbon monoxide fumes after losing power and running a generator inside their home. Winds gusted to 54 MPH at Andrews Air Force Base at 1:22 PM EDT and 46 MPH in College Park at 3:39 PM EDT. Downed trees blocked 33 streets and flooding closed 15 county roads. A 12 year old boy was caught in flood waters and was swept a half mile down a drainage ditch before being rescued and treated for hypothermia. A branch of the Patuxent River flooded onto Walter Street in Upper Marlboro. Forty buses could not be dispatched because of flooded lots.

In Anne Arundel County, 5 trains with over 1000 passengers were stranded up to 7 hours just north of BWI airport by a mudslide, water, and trees covering the tracks. At 9:30 AM EDT on the 16th, a tractor-trailer was blown over on the Chesapeake Bay Bridge. A wind sensor on the bridge recorded a gust of 81 MPH at 11:55 AM. Winds gusted to 66 MPH at Thomas Point Lighthouse, 56 MPH at the Naval Academy in Annapolis, 48 MPH at Brooklyn Park, and 43 MPH at Baltimore/Washington International Airport. Over 77,000 customers lost power after hundreds of trees and power lines were downed. It took over a week to restore power to all customers. Several hundred roads were closed by downed trees and high water. County officials reported 350 flooded basements and 2 water rescues. Some basement walls collapsed, including one in a 15 unit townhouse structure. Shady Side and Bay Side beaches along the Patapsco River were flooded by torrential rains. The county fair was shut down for the first time in its 47 year history. An ailing historical landmark, the Liberty Tree at St. John's College in Annapolis, was also dealt a final blow by the hurricane. In Baltimore, evacuation orders were issued for businesses near the confluence of Jones Falls and Western Run after both streams overflowed their banks. The water submerged a used car lot and washed out a bridge on Maisel Street near Morrell Park. Winds gusted to 62 MPH on Television Hill. Officials reported 750 downed trees across the city, including 35 which damaged homes. Up to 91,000 customers lost power, and the outage led to the release of 24 million gallons of raw sewage into Jones Falls.

Across Baltimore County, 57,000 customers lost power. Winds gusted to 69 MPH at Martin State Airport at 3:05 PM EDT, 56 MPH in Bowie, and 52 MPH in Towson and Parkton. Hundreds of trees fell in Gunpowder State Park. Countywide, fallen trees damaged homes, sheds, fences, and cars, and closed 125 roads. Officials reported 6 rapid water rescues and 350 flooded basements. A 10 year old boy was swept into a storm drain and carried 300 feet in a buried pipe before fire fighters opened a manhole cover and rescued him uninjured. In Harford County, Lilly Run flowed out of its banks and closed all roads in Havre de Grace, isolating the city hospital. Nearly 560 other county roads were closed by high water and downed trees. Around 53,000 customers lost power, and some residents waited a week for service to return. North Bay buoy recorded a wind gust of 55 MPH. High water damaged 40 bridges, washed out 250 feet of roadway, and washed away 125 feet of a 2 ft diameter sewer line. Seventeen homes reported major damage and 26 homes sustained minor damage. Officials reported 12 evacuations, 300 flooded basements, and 15 injuries. Numerous travellers took shelter at the Interstate 95 Chesapeake House rest stop when heavy rain reduced visibility to 200 feet.

In Carroll County, 10 roads in the eastern half of the county were closed by small stream flooding and downed trees. Downed power lines resulted in 7100 electrical outages. In Howard County, 35,000 customers lost power and some waited 4 days for power to return. A wind gust of 46 MPH was reported in Laurel. Downed trees and high water closed 200 roads and intersections, including a portion of Route 1. Two homes were damaged by fallen trees and one downed tree blocked Interstate 70. In Patapsco Valley State Park, 40 trees fell onto park roads. Most tree damage occurred east of a line from Ellicott City to Elkridge. County officials rescued 10 motorists who drove into flood waters. In Montgomery County, hundreds of trees were downed and 20 roads were closed. At least 5000 customers lost power after trees fell onto power lines. Several roads were water covered and a few roads were closed by high water. Frederick County reported several downed trees and 3000 power outages. Some roads were flooded by swollen streams in the eastern portion of the county. In the city of Hagerstown in Washington County, a large tree limb was downed onto a home, tearing off

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

MARYLAND, Central

the gutter and screen door. A wind gust of 42 MPH was recorded in Hagerstown at 7:03 PM EDT.

Washington County Sharpsburg

29 2130EST
2330EST
Over 2 inches in 2 hours
0 0
Heavy Rain

Frederick County Countywide

29 2200EST
2355EST
Over 2 inches in 2 hours
0 0
Heavy Rain

Washington County Hancock

29 2215EST
2 buildings damaged on Willow Road
0 0 5K
Thunderstorm Wind

Washington County Clear Spg to Hagerstown

29 2235EST
2250EST
Trees and power lines downed
0 0 5K
Thunderstorm Wind

Frederick County Countywide

29 2300EST
2320EST
Numerous trees and power lines downed
0 0 10K
Thunderstorm Wind

Montgomery County Damascus

29 2330EST
Several trees downed on Brink Road at Route 108
0 0 3K
Thunderstorm Wind

Montgomery County Laytonsville

29 2330EST
Tree downed
0 0 0.50K
Thunderstorm Wind

Carroll County Taneytown

29 2345EST
12 trees downed
0 0 3K
Thunderstorm Wind

Carroll County Westminster

29 2345EST
Estimated 60 MPH wind gust
0 0
Thunderstorm Wind (G52)

Prince George's County Mitchellville

30 0003EST
4 feet diameter oak trees downed
0 0 2K
Thunderstorm Wind

Howard County Columbia

30 0005EST
Power lines downed
0 0 3K
Thunderstorm Wind

Baltimore City (C) Baltimore

30 0025EST
60 trees downed
0 0 15K
Thunderstorm Wind

Anne Arundel County North Portion

30 0030EST
Several trees downed, concentrated in the Annapolis area
0 0 10K
Thunderstorm Wind

An area of intense showers moved across much of Maryland from 10:00 PM EDT on the 29th through 2:00 AM EDT on the 30th, producing winds in excess of 55 MPH and very heavy downpours. Minor flooding was reported in a few locations, and high winds knocked numerous trees and power lines down. In Washington County, high winds damaged 2 buildings on Willow Road in Hancock. Trees and power lines were downed from Clear Springs to Hagerstown. A wind gust of 51 MPH was recorded in Hagerstown at 11:53 PM EDT. Sharpsburg recorded 2.49 inches of rainfall. In Frederick County, rainfall amounts included 2.80 inches at Wolfsville, 2.5 inches at Thurmont, and 2.45 inches at Catocin Mountain Park. Trees and power lines were downed in Libertytown, Urbana, Emmitsburg, Yellow Springs, Meyersville, Frederick, and Brunswick. 6000 county customers lost power as a direct result of the storm. Four roads were closed by fallen trees, and the MARC train was delayed by debris on the tracks in Brunswick. Trees and power lines were downed in Montgomery County, resulting in 6600 electrical outages. Trees blocked Route 108 at Brink Road in Damascus. Three trees were downed, loose items were thrown about, and leaves were plastered against one side of a home in Laytonsville. In Carroll County, winds gusted to 65 MPH in Westminster around 12:45 AM EDT. A wind gust of 53 MPH was recorded in Millers at around 1:00 AM EDT. A dozen large trees were downed in Taneytown. Howard County reported downed trees and power outages near Route 32 and 39 in Columbia. In Prince George's County, 4200 customers lost power. Trees were downed in Mitchelsville around 1:00 AM EDT. Winds gusted to 43 MPH at Andrews Air Force Base at 1:03 AM EDT and 41 MPH at the University of Maryland in College Park. Oxon Hill reported 1.47 inches of rainfall. Anne Arundel County reported several downed trees in the northern half of the county. Winds gusted to 44 MPH at Baltimore/Washington International Airport (BWI) at 1:12 AM EDT. Annapolis reported 2.30 inches of rainfall and BWI received 1.16 inches. Over 60 trees and many power lines were downed in the city of Baltimore. 14,000 city customers lost power.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

MARYLAND, Northeast

MDZ008-012-015-019>020 **Cecil - Kent - Queen Annes - Talbot - Caroline**

01 0000EST 0 0 Drought
21 0800EST

The drought that gripped the Middle Atlantic States throughout much of the growing season eased in mid August. Normal, and in some cases, heavier than normal rainfall returned. On September 1st Governor Parris N. Glendening lifted the mandatory watering and open burning restrictions across the Eastern Shore. About a week later watering restrictions were either loosened or lifted completely in Elkton, North East and Rising Sun (all Cecil County). The drought for all intents and purposes ended with the arrival of the unprecedented rain associated with Hurricane Floyd on the 16th. As much as 14 inches of rain (or about 4 months worth of normal rainfall) fell from Floyd across the Eastern Shore. The drought emergency was lifted by Governor Glendening on the 21st. The heavy rain came too late to help farmers. Agricultural losses throughout the state of Maryland were estimated at around 100 million dollars: 75 million from crop losses and another 25 million from the drop in crop prices from 1998. The 1999 corn harvest of 34 million bushels was 9.6 million bushels less than 1998 and the smallest since 32.8 million bushels in 1993. The soybean harvest of 11.7 million bushels in 1999 was 2.6 million bushels less than 1998 and the smallest harvest since 9.2 million bushels in 1987. The drought also greatly affected pastures and produced a later and smaller than usual pumpkin crop.

Cecil County
Perryville to
Rising Sun

06 1545EST 0 0 Thunderstorm Wind (G50)
1600EST

A severe thunderstorm knocked down several trees from Perryville to North East in Cecil County. One roof was ripped apart by the severe thunderstorm in Perryville.

Kent County
Countywide

16 0800EST 0 0 1M Flash Flood
17 0800EST

MDZ008-012-015-019>020 **Cecil - Kent - Queen Annes - Talbot - Caroline**

16 0800EST 0 0 500K High Wind (G50)
2200EST

Caroline County
Countywide

16 0830EST 0 1 3.3M Flash Flood
17 2300EST

Cecil County
Countywide

16 0830EST 0 2 3M Flash Flood
17 1100EST

Queen Anne'S County
Countywide

16 0830EST 0 2 4M Flash Flood
18 1100EST

Talbot County
Countywide

16 0830EST 0 0 3.5M Flash Flood
17 1100EST

Hurricane Floyd battered the Maryland Eastern Shore on September 16th and brought with it torrential rains and damaging winds. The hurricane caused widespread flash flooding as storm totals averaged around ten inches, most of which fell in a twelve hour period from the early morning through the afternoon on the 16th. The highest verifiable storm total was 14.00 inches in Chestertown (Kent County). Based on Doppler Radar storm totals estimate similar amounts also fell across northern Queen Anne's County. Flooding along tidal sections of inland creeks and rivers were exacerbated during times of high tide. The torrential downpours associated with Hurricane Floyd exceeded the 100-year-flood return period for most of the Eastern Shore. Hundreds of roads and bridges were closed. At one point there were 225 roads closed throughout the state. About 450 people were evacuated from low lying areas, 300 in Cecil County. Five people were seriously injured. Dozens more were rescued from trapped vehicles. A 32-year-old man died on September 19th near Centreville (Queen Anne's County) when he was ejected from his motorcycle while attempting to jump over a washed out bridge. While the highest wind gusts in most areas were less than 60 mph, the combination of the heavy rain that loosened the ground and the persistence of the strong winds uprooted hundreds of trees across the Eastern Shore. About 17,000 homes and businesses lost power. Power was restored by the 19th. A state of emergency was declared on the 16th and all schools were closed. The preliminary damage estimate was 15.25 million dollars. President Clinton declared all of the Maryland Eastern shore a disaster area.

Hurricane Floyd began as a Cape Verde type hurricane east of the Lesser Antilles. As Floyd moved west, it passed to the north of and spared both the Greater and Lesser Antilles. Floyd intensified into a Category IV (Major) Hurricane on the Saffir-Simpson Scale. Floyd was a very large sized hurricane that prolonged both the torrential rain and high winds. Floyd was heading for Florida before a turn to the northwest spared the state, but Floyd battered the Bahamas. The anticipated turn to the north and the northeast occurred on the 15th as Floyd was heading for North Carolina. Another important synoptic feature was a cold front that was over West Virginia on the 14th. This front stalled just west of Chesapeake Bay on the 15th. The stalled front not only failed to push offshore an already tropical and humid air mass that was over the Western Shore, but also acted as a conduit for the tropical moisture associated with Floyd. The moisture headed west toward the front and then rode north along the boundary. Light rain associated with Floyd started along the Eastern Shore on the 15th. The torrential rain associated with Floyd arrived in the Eastern Shore just after midnight on the 16th. Floyd was still offshore south of North Carolina. Floyd made its initial landfall during the early morning hours of the 16th at

Storm Data and Unusual Weather Phenomena

		Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		September 1999
Location	Date				Killed	Injured	Property	Crops	Character of Storm

MARYLAND, Northeast

16th. Floyd was still offshore south of North Carolina. Floyd made its initial landfall during the early morning hours of the 16th at the Mouth of Cape Fear or Bald Head Island in North Carolina and accelerated as it proceeded northeast. Damaging east winds arrived on the Lower Eastern Shore by 9 a.m. EDT as the torrential rain continued. Meanwhile a weakened Category One Floyd moved through Virginia Beach Virginia and was back over the open Atlantic Ocean around noon on the 16th. Floyd continued to move northeast and the eye passed just east of the Virginia Capes and Fenwick island, Delaware. By noon on the 16th all the torrential rain had moved north of Floyd and ended with the passage of the hurricane (on the same latitude line). During the afternoon of the 16th all of the sustained hurricane force winds were located over the Atlantic, although damaging winds continued. At 5 p.m. EDT Floyd was downgraded to a tropical storm as it passed about 10 miles east of Atlantic City. By 5 p.m. EDT the torrential rain was over for the Eastern Shore. But in some cases (especially in Cecil County), the strongest winds associated with Floyd mixed down as cooler air behind the system moved into the region. The strong winds persisted through the evening of the 16th. Wind gusts rarely exceeded 50 mph, but all the flooding rains made it easy for trees to be knocked over. Tropical Storm Floyd made landfall again on western Fire Island in Suffolk County, New York around 8 p.m. EDT and was located near Portland, Maine at 8 a.m. EDT on the 17th.

In Cecil County, flash flooding closed 62 roads at one point. Twenty roads were still closed the morning of the 17th. Infrastructure damage alone was nearly 1 million dollars. Ninety-two homes and 78 businesses were severely damaged. Hundreds others were flooded. Hardest hit were North East and Elkton. In North East, the Little Northeast Creek flooded and the municipality almost became an island. Evacuations started at 10 a.m. EDT as about 100 people sought shelter. The northbound bridge on Maryland State Route 272 was washed away. Two hundred homes were flooded. Catherine Street was cratered and a 20-year-old man was injured when he fell into the hole. Four tanks that contained 80,000 gallons of oil collapsed and began floating downstream. In Elkton, the Big Elk Creek flooded the downtown business area. The flood waters were 5 to 6 feet higher than ever seen. The hospital had first floor flooding. The Commercial Plaza on Maryland State Route 213 was ruined. It was expected to be closed for six weeks. A 13-year-old boy was plucked from the Big Elk Creek. Others were rescued from car tops. Farther upstream the Big Elk Creek washed away a bridge in the Fair Hill National Resource Management Area. In Earleville, the county dam was damaged by the bloated Scotchman Creek. One hundred feet of Mill Lane was washed away and the 23 acre Mill Pond emptied. Evacuations occurred in Conowingo, Elkton, North East, Octararo, Rising Sun and Sun Valley. Four trailers were completely destroyed by flood waters in Conowingo. The strong winds also knocked down numerous trees. Several houses and vehicles were damaged.

Kent County appeared to escape with the least amount of damage from Floyd. Road closures began at 915 a.m. EDT. Hardest hit were homes in Sandfield just outside of Millington (Queen Anne's County). The only railroad service into Queen Anne's County was suspended after flooding along the Charles River crippled the railroad's trestles. There were voluntary evacuations in low-lying areas and also in some mobile home parks. Many roads were also closed on Miller's Island.

Queen Anne's County was one of the harder hit counties on the Eastern Shore by Floyd. Water rescues started at 10 a.m. EDT and continued all day. About 75 persons were evacuated to shelters. Fifty-five roads were closed during the height of the storm including major roadways such as U.S. Route 50 and Maryland State Routes 213, 291, 300, 304 and 313. Two 29-year-old men were injured when their pickup truck fell into a 30 foot by 30 foot hole on MD 304 near Centreville. Thirty-four roads were closed by either heavy flooding or minor to moderate damage. Twenty bridges or culverts were washed out or had substantial damage. All roads that were not badly damaged were reopened Saturday afternoon the 18th. All county roads were reopened by the 21st although eight bridges and three state roads were still closed. The number of bridge closings was down to six on October 2nd. In addition, fallen trees blocked about 70 roads throughout the county. Most of the damage occurred in the northern half of the county. The worst flood related property damage occurred on the Queen Anne's side of Millington along the Chester River. Forty homes were damaged, 15 of them in Sandtown had six foot high water marks on the first floor. Ten homes and several businesses along the Tuckahoe Creek in Queen Anne were badly flooded. Some persons were still displaced on October 9th. Other townships that also were hit hard by flooding were Centreville, Church Hall and Sudlersville (The downtown area became an island.) Damaging winds buffeted Kent Island starting at 9 a.m. EDT. The Cloverfields Community was hardest hit with 100 homes damaged by the high winds and downed trees. Traffic was backed up for 2.5 hours over the Chesapeake Bay Bridge when an empty tractor trailer ignored posted restrictions and blew over. The Queen Anne County Library was also damaged by large trees.

In Caroline County, towns near rivers (Denton, Federalsburg, Greensboro and Hillsboro) bore the brunt of the damage. Six roads and thirty bridges were in need of repairs. About 20 people were in shelters throughout the county. A dam break near Harmony closed Maryland State Route 16. Other dam failures or spillovers occurred on Lake Bonnie near Goldsboro, Crouse Mill in Tuckahoe State Park and Chambers Lake near Federalsburg. Three schools suffered water damage. Large pieces of roadways collapsed on Maryland State Route 480 and Second Street in Denton. Infrastructure damage alone was estimated as high as 2.5 million. A truck driver was injured when his vehicle overturned on a flooded Maryland State Route 312.

In Talbot County, flooding forced the closure of numerous roads in Easton, St. Michael's and Oxford. At 1040 a.m. EDT, a man hanging from a branch was rescued in Easton. About 75 people went to shelters as citizens in low-lying areas were urged to evacuate. On the Talbot County side of Queen Anne, severe damage occurred to 10 homes, three businesses and 30 vehicles on Cannery Road. The water was up to 10 feet high on the 16th and their was still up to six feet of water in the streets the next day. Downed trees caused about 3,000 homes and businesses to lose power in Easton, Saint Michael's and Trappe. A wind gust to 50 mph was recorded in Royal Oak.

Storm totals included 14.00 inches in Chestertown (Kent County), 12.00 inches in Rock Hall (Kent County), 11.20 inches in

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of Persons	Estimated Damage	September 1999		Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)			Property	Crops	

MARYLAND, Northeast

Storm totals included 14.00 inches in Chestertown (Kent County), 12.00 inches in Rock Hall (Kent County), 11.20 inches in Federalsburg (Caroline County), 9.16 inches in Royal Oak Oak (Talbot County), 9.15 inches in Easton (Talbot County), 9.00 inches in North East (Cecil County) and 6.57 inches at the Conowingo Dam in Cecil County. School were closed on the 16th. Another effect of Floyd was a boom in the mosquito population throughout the Middle Atlantic States.

MDZ008-012-015-019>020

Cecil - Kent - Queen Annes - Talbot - Caroline

30 2359EST

0

0

Unseasonably Wet

Courtesy of Hurricane Floyd, September 1999 went down as one of the wettest Septembers on record. In the state of Maryland, the statewide monthly average rainfall of 9.02 inches was the third wettest September on record since 1895. Monthly county weighted rainfall amounts averaged even higher along the Eastern Shore, all in the double digits. On a county weighted average September monthly rainfall totals ranged from 10.2 inches in Talbot County to 14.3 inches in Cecil County. In Easton (Talbot County), 12.86 inches of rain fell during the month.

MARYLAND, South

MDZ021>025

Dorchester - Wicomico - Somerset - Inland Worcester - Maryland Beaches

15 1200EST

0

0

278K

575K

Hurricane

16 1700EST

Hurricane Floyd was a Category 1 hurricane as it crossed the Wakefield WFO county warning area. Tropical storm force wind gusts occurred over the northwest quadrant of the storm over portions of the Lower Maryland Eastern Shore. The highest sustained wind speed recorded was 36 mph at Ocean City Maryland (OXB). The highest sustained wind speed recorded at Salisbury (SBY) was 32 mph. The highest gusts recorded were 52 mph at Ocean City, and 48 mph at Salisbury. Few trees and power lines were blown down across the Lower Maryland Eastern Shore resulting in scattered power outages. Storm surge flooding of 5 to 7 feet occurred over central portions of the Chesapeake Bay inundating sections of Dorchester and Somerset counties. Five feet of water flooded portions of Crisfield in Somerset county. Rainfall amounts generally ranged from 3 to 6 inches across much of the Lower Maryland Eastern Shore and caused some crop damage and street flooding. The lowest sea level pressure recorded was 976.8 mb at Ocean City (OXB).

MARYLAND, West

MDZ001

Garrett

01 0000EST

0

0

Drought

30 2359EST

Rainfall averaged around 0.40 inches above normal for September, easing drought conditions a bit. The main contributor to the rainfall total was the remnants of Hurricane Floyd, which passed to the east of the area. As a result of the rainfall, the governor downgraded the drought emergency to a drought warning for Garrett County, as well as the entire state of Maryland. However, the 365-day rainfall still remained around 5.0 to 7.0 inches below the 30-year normal and the Palmer Drought Severity Index still showed Garrett County continuing under an extreme drought through September.

MASSACHUSETTS, Central and East

MAZ012-015>016

Southern Worcester - Suffolk - Eastern Norfolk

07 0000EST

0

0

Record Warmth

09 2359EST

Record warm minimum temperatures were set at the Blue Hill Observatory in Milton, and in Boston and Worcester. On the 7th, the low temperature of 70 degrees at the Blue Hill Observatory broke the previous record high minimum temperature of 68 degrees, which was set in 1943.

Low temperatures at the Blue Hill Observatory only fell to 69 degrees on the 8th and 9th, which broke the previous record warm minimum temperatures of 68 degrees in 1943, and 68 degrees in 1936, respectively.

At Logan International Airport in Boston, the low temperature of 71 degrees on the 8th tied the record warm minimum temperature which was set in 1945, while the low of 72 degrees on the 9th broke the previous record warm minimum temperature of 70 degrees set in 1884.

In Worcester, low temperatures fell to 69 degrees on both the 8th and the 9th. This tied the record warm minimum temperatures for both dates, which were set in 1915.

Bristol County

Norton

10 0700EST

0

0

Heavy Rain

1900EST

Essex County

Manchester

10 0700EST

0

0

Heavy Rain

1900EST

Hampden County

Wilbraham

10 0700EST

0

0

Heavy Rain

1900EST

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

MASSACHUSETTS, Central and East

Middlesex County									
Wayland	10	0700EST			0	0			Heavy Rain
		1900EST							
Norfolk County									
Franklin	10	0700EST			0	0			Heavy Rain
		1900EST							
Suffolk County									
(Bos)Logan Intl Arpt	10	0700EST			0	0			Heavy Rain
		1900EST							
Worcester County									
Blackstone	10	0700EST			0	0			Heavy Rain
		1900EST							
Middlesex County									
Newton to	10	1845EST			0	0			Flash Flood
Framingham		2100EST							
Suffolk County									
Boston	10	2300EST			0	0			Flash Flood
	11	0300EST							

A slow moving cold front, combined with a plume of tropical moisture moving in from the south, combined to bring heavy rainfall to much of central and eastern Massachusetts. The heaviest rainfall was centered along the Interstate 495 corridor in Norfolk, Worcester, and Middlesex Counties where totals of 5 to 6 inches were common. As much as 6.60 inches fell in Franklin. Totals elsewhere generally averaged between 3 and 5 inches.

The heavy rain caused significant urban and poor drainage flooding. In Boston, the 4.71 inches of rain which fell set a new daily rainfall record at Logan International Airport. The Central Artery and portions of Morrissey Boulevard and Quincy Shore Drive were submerged under feet of water and shut down. There were numerous reports of flooded homes in Newton, Natick, and Framingham, all in Middlesex County. Portions of Route 9 in Framingham were submerged under feet of water. In Worcester County, the 2.35 inches of rain that fell at Worcester Airport set a new daily rainfall record.

Barnstable County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Bristol County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Essex County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Franklin County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Hampden County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Hampshire County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Middlesex County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Norfolk County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Plymouth County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Suffolk County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							
Worcester County									
Countywide	16	1400EST			0	0			Heavy Rain
	17	0300EST							

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Property	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage			

September 1999

MASSACHUSETTS, Central and East

MAZ003>005-009>011-019>020-022>023 Eastern Franklin - Northern Worcester - Western Middlesex - Western Hampden - Eastern Hampshire - Eastern Hampden - Eastern Plymouth - Southern Bristol - Barnstable - Dukes

16 1600EST 0 0 High Wind (G63)
17 0300EST

MAZ002-006>008-012>018-021 Western Franklin - Western Essex - Eastern Essex - Western Hampshire - Southern Worcester - Western Norfolk - Southeast Middlesex - Suffolk - Eastern Norfolk - Northern Bristol - Western Plymouth - Southern Plymouth

16 1800EST 0 0 Strong Wind
17 0100EST

**Middlesex County
Winchester**

16 2045EST 0 0 Flood
2100EST

Aberjona River

MAZ011 Eastern Hampden

16 2300EST 0 0 Flood
17 0000EST

Westfield River

Tropical Storm Floyd brought high winds and torrential rainfall to Massachusetts as it tracked from northern Connecticut into central and northeast Massachusetts during the late evening and early morning hours of the 16th and 17th. Although many areas received strong winds, the strongest winds were confined to the higher elevations of western Massachusetts, as well as Cape Cod and the islands. Gusts of 60 to 70 mph were common along the south coast, but the New Bedford Hurricane Barrier reported a gust to 76 mph. There were many reports of downed trees and power lines in these two areas. Damage was not as widespread throughout central and eastern Massachusetts, where winds generally gusted to 40 to 50 mph.

Floyd also brought torrential rainfall to the Bay State. The heaviest rain fell over the Connecticut River Valley, to the left of the track of the center, where totals of 6 to 10 inches were common. Southwick reported 9.16 inches of rain, Whately had 7.70 inches, and Millers Falls had 6.20 inches. The heavy rain caused the Westfield River at Westfield to rise out of its banks for a brief period. It crested at 13.1 feet at 12:30 am on the 17th, which was just over its 13 foot flood stage. Many small streams rose out of their banks in western Massachusetts and flooded nearby low lying areas. No flood damage was reported.

MAZ020>023 Southern Bristol - Southern Plymouth - Barnstable - Dukes

30 0900EST 0 0 Strong Wind
1400EST

Strong south winds ahead of an approaching cold front gusted to near 50 mph across southeast Massachusetts. The New Bedford Hurricane Barrier reported a gust to 51 mph, while the Buzzards Bay entrance tower, which is elevated, had a gust to 58 mph. Sustained winds averaged 30 to 40 mph over most of the region as well. There were no reports of damage.

MASSACHUSETTS, West

**Berkshire County
Countywide**

16 1825EST 0 0 250K Flood
17 0900EST

**MAZ001
Countywide**

Berkshire
16 1825EST 0 0 75K High Wind
17 1000EST

The remnants of Hurricane Floyd moved up the eastern seaboard on September 16 and during the early hours on September 17. The storm brought both high winds and heavy rainfall to the western Berkshires. A large swath of 2 to 5 inch rainfall was observed. Specific rainfall amounts included 2.76 inches at Dalton, 3.56 at Lenoxdale, 4.86 at Florida and 5.22 at West Otis. The rain produced significant flooding across the region which proved destructive. Flooding was noted on the Housatonic at Great Barrington as it crested at nine feet, more than five feet above flood stage there. In addition, rains flooded many roadways. Winds from the passage of Floyd were estimated as high as 60 mph, especially across the hilltowns. The combination of the wind and very saturated ground, produced widespread downing of trees and power lines across portions of eastern Berkshire county. The greatest concentration of trees blew down close to Pittsfield. Some roads were closed due to trees down across them.

MICHIGAN, East

**Macomb County
1 W Utica**

06 1700EST 0 0 30K Flash Flood
2000EST

**Macomb County
3 N Utica**

06 1730EST 0 0 Hail (1.00)

A slow moving cold front drifted into southeast Michigan during the late afternoon and early evening hours, igniting thunderstorms as it went. Only one storm became severe, dumping quarter-sized hail in Shelby Township, just north of Utica. The storms were slow moving, and so produced locally heavy rain. A spotter in Shelby Township measured 3.41 inches of rain as the storms passed. Flash flooding closed a new section of state highway 59 (M-59), near Mound Road just west of Utica. The flooding occurred in the recessed

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property Damage	Crops	

MICHIGAN, East

freeway, due to a combination of runoff from the heavy rain, and the failure of a pumping system designed to keep the highway dry. A lightning strike may have contributed to the failure of the pumping system. Several vehicles had to be abandoned in the rising water, and the freeway was closed for several hours to clean up the water and mud left behind. In addition, minor flooding occurred at an apartment complex in Utica.

The heaviest rain in all of southeast Michigan fell in Washtenaw County, between Saline and Manchester, where around 4 inches of rain occurred. However, no flooding problems occurred in this rural area. At Detroit Metropolitan Airport, 76 flights were delayed due to the thunderstorms. Part of a terminal at the airport suffered water damage, as a roofing project was in progress when the storms hit.

Oakland County 2 SE Ortonville

28 1745EST 0 0 3K Thunderstorm Wind (G52)

A stationary front stretched from South Bend to central Lake Huron. Numerous showers and thunderstorms developed along the front, then moved east into southeast lower Michigan. One of these storms downed trees near Ortonville.

MICHIGAN, Extreme Southwest

NONE REPORTED.

MICHIGAN, North

NONE REPORTED.

MICHIGAN, Upper

NONE REPORTED.

MICHIGAN, West

Jackson County Countywide

28 1828EST 0 0 10K Thunderstorm Wind (G53)
1837EST

Thunderstorm winds knocked down several trees, and one car drove into a tree that fell on a road. Pea sized hail was reported as well. Thunderstorms developed in the mid afternoon hours along and ahead of a slow moving cold front. The thunderstorm that moved into Jackson County from St. Joseph County became severe, producing wind gusts to 60 mph, and pea sized hail.

MINNESOTA, Central and South Central

Douglas County								
Osakis	03	1515CST		0	0			Hail (0.75)
Nicollet County								
6 NW St George	07	1620CST		0	0			Hail (0.88)
Renville County								
5 SE Fairfax	07	1620CST		0	0			Hail (0.75)
Faribault County								
Winnebago	07	1705CST		0	0			Hail (1.25)
Steele County								
6 SW Owatonna	07	1710CST		0	0			Hail (1.75)
Waseca County								
Waseca	07	1716CST		0	0			Hail (1.00)
Steele County								
3 W Owatonna	07	1730CST		0	0			Hail (1.75)
Scott County								
Savage	07	1854CST		0	0			Hail (0.75)
Dakota County								
Burnsville	07	1855CST		0	0			Hail (1.00)
Anoka County								
Centerville	07	1905CST		0	0			Hail (0.75)
Ramsey County								
White Bear Lake	07	1905CST		0	0			Hail (0.75)
Lac Qui Parle County								
Madison	18	2124CST		0	0			Hail (0.75)
Lac Qui Parle County								
8 SW Dawson	18	2130CST		0	0			Hail (1.50)
Lac Qui Parle County								
10 N Dawson	18	2130CST		0	0			Hail (0.75)

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated		September 1999
		Local/	Length	Width	Persons		Damage		
Location	Date	Standard	(Miles)	(Yards)	Killed	Injured	Property	Crops	
Character of Storm									

MINNESOTA, Central and South Central

Chippewa County									
2 SW Milan	18	2145CST			0	0			Hail (0.75)
Chippewa County									
Milan	18	2150CST			0	0			Hail (1.75)
Kandiyohi County									
5 WSW Regal	25	1930CST			0	0			Hail (1.00)
		Hail partially covered the ground.							
Stearns County									
2 S Belgrade	25	1935CST			0	0			Hail (0.75)

MINNESOTA, Northeast

St. Louis County									
Hoyt Lakes	07	1714CST			0	0			Hail (1.25)

MINNESOTA, Northwest

MN2017-024		South Beltrami - Hubbard							
01		0000CST			0	0			Flood
04		2359CST							
		4 to 5 inches of rain fell in 4 days, complicating an already wet summer. Many problems were reported along US Highway 2 near Bemidji. Some basement pumps had to be run continuously to keep basements from filling up. The KOA campground west of Bemidji only had 50 percent of their campsites useable, with the others under water. They had to pump the sewer lines continuously to keep them from backing up. Loggers could not get into the woods to work. Farmers reported cattle dying from disease due to being wet. Lake owners in the Cass Lake area reported high lake levels and shoreline erosion.							
Wadena County									
1 E Nimrod	02	0805CST			0	0			Hail (0.75)
Lake Of The Woods County									
Williams	07	0735CST			0	0			Hail (0.75)

MINNESOTA, Southeast

NONE REPORTED.

MINNESOTA, Southwest

Pipestone County									
Ruthon	11	1648CST			0	0			Hail (0.88)
Pipestone County									
Ruthon	11	1648CST			0	0	5K		Thunderstorm Wind (G50)
		Thunderstorm winds caused tree damage, including large branches blown down.							

MINNESOTA, West

NONE REPORTED.

MINNESOTA, West Central

NONE REPORTED.

MISSISSIPPI, Central

Hinds County									
Jackson	06	1750CST			0	0	40K		Thunderstorm Wind
		Several businesses received significant damage and numerous trees were blown down near the intersection of Siwell and Raymond Roads.							
Hinds County									
Utica	08	1200CST			0	0	2K		Thunderstorm Wind
		Several trees were blown down.							
Hinds County									
Terry	08	1232CST			0	0	2K		Thunderstorm Wind
		Several trees were blown down.							
Clarke County									
Shubuta	08	1518CST			0	0	1K		Thunderstorm Wind
		A few trees were blown down.							

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

MISSISSIPPI, Central

Lowndes County Columbus Afb

26 1735CST **0 0 10K** **Thunderstorm Wind**
A few buildings received very minor damage and numerous trees were blown down. A power line was also blown down.

MISSISSIPPI, North

NONE REPORTED.

MISSISSIPPI, South

Pearl River County Carriere

07 1645CST **0 0 0.10K** **Thunderstorm Wind**
A tree was blown down across West Union Road.

Hancock County Waveland

29 1125CST **0 0 0.10K** **Thunderstorm Wind**
One tree and numerous limbs were blown down.

MISSISSIPPI, Southeast

NONE REPORTED.

MISSOURI, East

NONE REPORTED.

MISSOURI, Lower

NONE REPORTED.

MISSOURI, Northwest

Platte County Parkville MOZ054

07 1716CST **0 0** **Hail (1.00)**
Henry
28 0000CST **0 0** **Flood**
30 2359CST

A two-day event dropped up to 4 inches of rain on west-central Missouri on the 27th and 28th. The result was minor river flooding on the South Grand River near Urich.

MISSOURI, Southeast

MOZ076-086>087-100- Perry - Bollinger - Cape Girardeau - Wayne - Carter - Ripley - Butler - Stoddard - Scott - Mississippi - New Madrid

01 0001CST **0 0** **Drought**
30 2359CST

The severe summer drought took a major toll on crops across Southeast Missouri. Rainfall at Cape Girardeau for the three-month period from July through September was just under two inches. This compares to a 3-month average of around 10 inches. Cape Girardeau received 0.98 inches in September, which is about 3 inches below normal. The soybean crop suffered the greatest effects from the drought, with yields estimated less than 50 percent of normal. The root systems of many shrubs and young trees were damaged by the drought. Some shrubs and shallow-rooted trees, such as dogwood and redbud trees, died during the summer. The effects of the drought were greatest closest to the Bootheel, from New Madrid to Cape Girardeau. Rainfall was higher to the north and west, especially from Perryville to the Poplar Bluff area. High fire danger prompted Cape Girardeau County to ban open burning.

MISSOURI, Southwest

Barton County Mindenmines

04 1525CST **0 0 0** **Thunderstorm Wind**
Thunderstorm winds downed tree limbs.

Barry County 8 SE Cassville

04 1735CST **0 0** **Hail (0.75)**

Newton County Saginaw

04 1900CST **0 0 0** **Flash Flood**
2200CST

Heavy rain from thunderstorms closed roadways near Saginaw in northwestern Newton County.

Barton County Lamar

07 1815CST **0 0** **Hail (0.88)**

McDonald County Anderson

07 1950CST **0 0 0** **Thunderstorm Wind (G62)**
Thunderstorm winds blew a semi truck off the road.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

MISSOURI, Southwest

Newton County
Neosho **07** **1950CST** **0** **0** **3K** **Thunderstorm Wind**
Thunderstorm winds downed power lines.

Barry County
Purdy **07** **2030CST** **0** **0** **0** **Thunderstorm Wind**
Thunderstorm winds downed tree limbs.

MONTANA, Central

Toole County
Shelby **10** **1755MST** **0** **0** **Thunderstorm Wind (G52)**

Liberty County
18 S Chester **10** **1855MST** **0** **0** **Thunderstorm Wind (G52)**

Hill County
16 SW Rudyard **10** **1915MST** **0** **0** **Hail (1.00)**

Chouteau County
Big Sandy **10** **1940MST** **0** **0** **Thunderstorm Wind (G52)**

MTZ013 **Fergus / Judith Basin**
25 **1100MST** **0** **0** **High Wind (G36)**
SUSTAINED WIND 36KT

MTZ012 **Cascade / Eastern Teton**
25 **1256MST** **0** **0** **High Wind (G35)**
SUSTAINED WIND 35KT

MTZ014 **Broadwater / Jefferson / Meagher / Central And Southern Lewis And Clark**
25 **1341MST** **0** **0** **High Wind (G56)**
HELENA ASOS

MTZ010 **Eastern Glacier / Eastern Pondera / Toole / Liberty**
29 **0035MST** **0** **0** **50K** **High Wind (G35)**
SUSTAINED WIND OF 35KT CTB ASOS...LOCALLY WINDIER WITH AN OIL SERVICE RIG TOPPLED OVER

MTZ009 **Rocky Mountain Front**
29 **0120MST** **0** **0** **High Wind (G95)**
6 SW OF EAST GLACIER

MONTANA, East

NONE REPORTED.

MONTANA, South

MTZ034 **Stillwater**
29 **0800MST** **0** **0** **High Wind (G51)**
1000MST
Nye reported a peak wind gust of 59 mph as strong southwest winds developed ahead of a cold front.

MONTANA, West

MTZ002 **West Glacier Region**
25 **0000MST** **0** **0** **Heavy Snow**
2300MST
Heavy snow fell over Glacier Park. 13 inches of new snow was recorded over Logan Pass which closed the road for 24 hours.

MTZ004-007 **Lower Clark Fork Region - Butte / Pintlar Region**
25 **0745MST** **0** **0** **High Wind (G50)**
1400MST
Metal roof torn off trailer home in Butte from strong winds. One power line was downed due to tree falling on it. Portions of roofing from a double wide mobile home in Whitepine, Sanders County was torn off from strong winds. Roofing landed on two trucks parked next to the mobilehome, crushing them. Wind, broken tree limbs and downed power lines knocked out power to approximately 515 customers in western Montana. In Plains, shingles were ripped from the roof on a home on Airport Road. Fallen trees downed power lines and fences in the Plains area.

NEBRASKA, Central

Sheridan County
5 W Antioch **01** **1700MST** **0** **0** **Hail (0.75)**

Sheridan County
15 N Ellsworth **01** **1735MST** **0** **0** **Hail (0.88)**

Sheridan County
3 NNE Ellsworth **01** **1800MST** **0** **0** **10K** **Thunderstorm Wind (G75)**
Several power poles were blown down.

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>NEBRASKA, Central</u>									
Sheridan County									
15 NNE Ellsworth	01	1805MST			0	0			Hail (0.88)
Cherry County									
48 SSW Merriman to 19 NNW Merriman	01	1825MST			0	0	4K	50K	Hail (1.75)
Cherry County									
40 SSW Merriman to 43 SSW Merriman	01	1830MST			0	0			Hail (1.00)
Cherry County									
47 S Merriman	01	1902MST			0	0			Hail (0.75)
Arthur County									
7 NNW Arthur	01	1930MST			0	0			Hail (1.00)
Mcpherson County									
25 NW Tryon	01	2005MST			0	0			Hail (0.75)
Hayes County									
8 NE Hamlet	02	1755CST			0	0			Hail (0.75)
Perkins County									
13 NNE Venango	03	2102MST			0	0			Hail (0.75)
Perkins County									
Grant	03	2115MST			0	0	25K		Thunderstorm Wind
Thunderstorm winds blew out the wall of a warehouse scattering debris for 200 yards.									
Lincoln County									
10 S North Platte	03	2324CST			0	0			Thunderstorm Wind (G73)
Lincoln County									
5 SE North Platte	03	2330CST			0	0	3K		Thunderstorm Wind
Thunderstorm wind broke numerous large tree limbs.									
Sheridan County									
3 S Hay Spgs	18	1845MST			0	0			Hail (0.75)
Cherry County									
15 W Brownlee	19	0100CST			0	0		15K	Hail (1.00)
<u>NEBRASKA, East</u>									
NONE REPORTED.									
<u>NEBRASKA, Extreme Northeast</u>									
NONE REPORTED.									
<u>NEBRASKA, Extreme Southwest</u>									
NONE REPORTED.									
<u>NEBRASKA, South Central</u>									
Furnas County									
Edison	03	1700CST			0	0	0	100K	Hail (2.00)
Furnas County									
Oxford	03	1715CST			0	0	0	0	Thunderstorm Wind (G50)
Gosper County									
14 SE Elwood	03	1720CST			0	0	0	0	Thunderstorm Wind (G50)
Strong winds and hail teamed to damage late season corn and soybean crops in eastern Furnas county.									
Gosper County									
11 S Elwood to 13 SE Elwood	11	1505CST 1510CST	1.5	20	0	0	0	0	Tornado (F0)
Isolated severe thunderstorms in south-central Nebraska produced a brief tornado. The tornado set down in rural southern Gosper county and no damage was reported.									
<u>NEBRASKA, West</u>									
Kimball County									
11 SW Bushnell	01	1619MST 1621MST			0	0			Thunderstorm Wind (G50)

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>NEBRASKA, West</u>									
Box Butte County 3 E Berea	01	1635MST 1640MST			0	0	10K		Hail (1.75)
									1.75 inch hail damaged house and broke windows 3 miles east of Berea, NE
Box Butte County (Aia)Alliance Arpt	01	1656MST 1657MST			0	0			Thunderstorm Wind (G62)
									71 MPH wind gust recorded at Alliance, NE airport
Cheyenne County 8 SW Sidney	01	1740MST 1745MST	0.2	30	0	0			Tornado (F0)
									Tornado spotted by off duty NWS employee.
Cheyenne County 10 NW Sidney	01	1749MST 1751MST			0	0			Thunderstorm Wind (G50)
									58 MPH wind gust.
Banner County 13 NW Harrisburg	02	1530MST 1532MST	0.1	30	0	0			Tornado (F0)
									Brief tornado spotted and videoed by storm chaser
Banner County 8 NE Harrisburg	02	1636MST 1640MST			0	0			Hail (1.00)
									1 inch hail reported 13 miles south of Scottsbluff, NE
Scotts Bluff County Gering	02	1710MST 1714MST			0	0			Hail (0.75)
Scotts Bluff County 2 S Melbeta	02	1721MST 1724MST			0	0			Hail (1.50)
Scotts Bluff County 1 S Melbeta	02	1723MST 1726MST			0	0			Hail (0.75)
Morrill County Bayard	02	1758MST 1801MST			0	0			Hail (1.00)
Cheyenne County 10 NW Sidney	02	2110MST 2114MST			0	0			Thunderstorm Wind (G65)
Scotts Bluff County 3 W Morrill	03	1731MST 1737MST	0.2	30	0	0			Tornado (F0)
									Brief tornado reported by public
Sioux County 28 S Agate	03	1744MST 1747MST	0.3	30	0	0			Tornado (F0)
									Brief tornado spotted by public neat the county line
Banner County 17 ENE Harrisburg	03	1825MST 1829MST			0	0			Hail (0.75)
									3/4 inch hail reported 9 miles south of McGrew, NE
Morrill County 2 N Bridgeport	03	1850MST 1852MST			0	0			Hail (0.75)
<u>NEVADA, North</u>									
NVZ006-008-012									
									Humboldt - Southwest And South Central Elko - Lander/Eureka
	09	1700PST 2000PST			0	0			Dust Storm
									A strong dry cold front producing winds of 30 to 40 mph caused an extensive area of blowing dust as these winds blew across a large area of land that had been burned due to wildfires. The blowing dust reduced visibility to near zero at times along Interstate 80 between Battle Mountain and Carlin. Large areas had visibility reduced to below 3 miles in blowing dust.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NEVADA, South

Clark County

4 NW Henderson

12 1600PST 0 0 Hail (0.88)

Nickel sized hail was briefly observed by a weather spotter in the Green Valley area of Henderson.

Clark County

Las Vegas

12 1825PST 0 0 5K Flash Flood

Clark County

14 W Las Vegas

12 1900PST 0 0 Flash Flood

Thunderstorms developed over the Las Vegas Valley along a line extending northeast from Henderson to the Spring Mountains. Locally heavy rain fell causing low-lying areas in Las Vegas to flood. At least one person had to be rescued from their car which was caught in water near Charleston and Interstate 15. Red Rock Canyon also experienced flash flooding which submerged roads and covered them with large rocks.

NEVADA, West

Washoe County

Reno

09 1451PST 0 0 0 Thunderstorm Wind (G60)

Thunderstorm wind gusts of 60 kts observed at Reno National Weather Service office.

Washoe County

Reno

09 1451PST 0 0 0 Thunderstorm Wind (G55)

Spotter report of thunderstorm winds of 63 mph in southwest Reno.

Washoe County

Reno

09 1500PST 0 0 0 Thunderstorm Wind (G56)

Thunderstorm wind gusts of 64 mph recorded by automated weather sensor 10 miles NNE of Reno.

NEW HAMPSHIRE, North and Central

NHZ001>010-013>014 Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham

10 0800EST 0 0 Heavy Rainfall
2200EST

Heavy rains developed over all of New Hampshire as a southeast flow of tropical moisture developed ahead of an approaching cold front. Rainfall amounts generally ranged from 1 to 2 inches in the northern part of the state to 2 to 4 inches in the southern part of the state. Rochester reported 4.45 inches of rain. Despite the heavy rainfall, no flooding was reported due to the drought conditions which preceded the storm. The rains came as a relief to many that were suffering from the drought.

NHZ001>010-013>014 Northern Coos - Southern Coos - Northern Grafton - Northern Carroll - Southern Grafton - Southern Carroll - Sullivan - Merrimack - Belknap - Strafford - Interior Rockingham - Coastal Rockingham

15 1500EST 0 0 Remnants Of Floyd
17 2300EST

Belknap County

Countywide

16 2230EST 0 0 431.7K Flood

18 0500EST

Grafton County

Countywide

16 2230EST 0 0 570.5K Flood

18 0500EST

NHZ003>005

Northern Grafton - Northern Carroll - Southern Grafton

16 2230EST 0 0 Flood
18 0500EST

A southeast flow of tropical moisture developed over New Hampshire late Wednesday, September 15 as Hurricane Floyd moved slowly northeastward along the East Coast of the United States. The rains became heavier on Thursday and Thursday night as the remnants of Floyd moved toward and into New England. By early Friday morning, the remnants of Floyd were centered over southeastern New Hampshire. As the storm continued to move to the northeast, precipitation tapered to scattered showers in southern parts of the state, however a steady, moderate to heavy rain continued in the north. Minor flooding occurred along the Pemigewasset and Saco Rivers. Strong winds accompanied the storm and then increased again on the back side of the storm during the day on Friday as high pressure pushed into the area. The winds knocked down tree limbs onto power lines causing power outages that affected about 10,000 customers. Some of the stronger winds gusts reported in the state included 47 mph in Portsmouth, 44 mph in Concord, 41 mph in Laconia, and 39 mph in Lebanon.

Rainfall totals from the event generally ranged from about 4 to 7 inches statewide, with some locally higher amounts. Mt. Washington reported 9.54 inches of rainfall, while Pinkham Notch reported 8.25 inches and Berlin reported 7.92 inches.

The Pemigewasset River at Plymouth was above the 15 ft. flood stage from 6:00 am on the 17th until 6:00 am on the 18th, cresting at 15.56 ft. at 12:30 pm on the 17th. The Saco River at Conway was above the 9 ft. flood stage on the 17th from 1:45 am until 7:30 pm, reaching a crest of 15.56 ft. at 12:30 pm.

Storm Data and Unusual Weather Phenomena

September 1999

									September 1999
		Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		
Location	Date				Killed	Injured	Property	Crops	Character of Storm

NEW HAMPSHIRE, Southern

Cheshire County

Countywide	16	1700EST			0	0			Heavy Rain
	17	0300EST							

Hillsborough County

Countywide	16	1700EST			0	0			Heavy Rain
	17	0300EST							

NHZ011

Cheshire	16	2051EST			0	0			Strong Wind
----------	----	---------	--	--	---	---	--	--	-------------

Tropical Storm Floyd brought torrential rainfall and strong winds to southern New Hampshire, as it tracked from Northern Connecticut into central and northeast Massachusetts. Rainfall totals of 3 to 5 inches were common throughout Cheshire and Hillsborough Counties, but amounts of 6 to 7 inches were observed in Hillsborough County from Greenville to Weare and Franconia. No flooding was reported, aside from low lying areas. The Piscataquog River at Goffstown came right up to its 9 foot flood stage, cresting at 8.9 feet at 315 pm on the 17th. Strong winds produced by Floyd brought down several small trees in Jaffrey.

NEW JERSEY, Northeast

Passaic County

Northwest Portion	08	1500EST			0	0			Flash Flood
-------------------	----	---------	--	--	---	---	--	--	-------------

As heavy showers and thunderstorms moved slowly east, they produced rainfall rates of at least 2 inches per hour. Aided by southeast winds, the heaviest rainfall occurred along the higher terrain of extreme northwest Passaic County. The highest rainfall amount measured was 3.86 inches at Monksville, where significant flooding occurred.

This rainfall was associated with the remnants of tropical system Dennis, as it moved west of the area.

Passaic County

Wayne	09	1550EST			0	0			Thunderstorm Wind (G60)
-------	----	---------	--	--	---	---	--	--	-------------------------

As a severe thunderstorm moved northeast, it produced high winds that downed several large trees about 1 1/2 miles north of the intersection of I-80 and Rte. 23 in Southern Wayne.

NEW JERSEY, South and Northwest

NJZ001-007>010-012>026

Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean

01	0000EST			0	0	80M	Drought
27	0800EST						

The drought that gripped the Middle Atlantic States throughout much of the growing season eased in mid August. Normal and in some cases heavier than normal rainfall returned. On September 14th Governor Christie Whitman lifted the drought emergency and mandatory watering restrictions across the eight southernmost counties in New Jersey (from Burlington and Ocean Counties south.). The drought for all intents and purposes ended with the arrival of the unprecedented rain associated with Hurricane Floyd on the 16th. As much as 14.5 inches of rain (or about 4 months worth of normal rainfall) fell from Floyd across the state. The drought emergency was lifted in the rest of the state by Governor Whitman on the 27th. The heavy rain came too late to help farmers. Agricultural losses throughout the state were estimated at around 80 million dollars. The 1999 corn harvest was only one third of 1998's (3 million vs 9 million bushels). The 1999 soybean harvest of 2.4 million bushels was 25 percent lower than 1998's. Other crops were also lower than 1998's harvest including wheat (down 17 percent) and hay (down 15 percent). The drought also dropped the apple, pumpkin and squash harvest by up to 50 percent as it not only decreased the harvest, but also the size of the crops.

Gloucester County

Countywide	05	1500EST			0	0			Heavy Rain
		2000EST							

A nearly stationary band of heavy rain associated with the remnants of Tropical Depression Dennis moved through Gloucester County during the late afternoon and early evening of the 5th. Storm totals ranged from just under one inch along the Camden County border to nearly two inches along the Salem County border. Some poor drainage flooding occurred, but no other damage was reported. With Tropical Depression Dennis still along the Virginia/North Carolina border at the time of the heavy rain, this band left the county vulnerable to additional heavy rain.

Salem County

Salem	09	1515EST			0	0			Thunderstorm Wind (G57)
-------	----	---------	--	--	---	---	--	--	-------------------------

A severe thunderstorm knocked down several trees and wires in Salem. Two homes were damaged by the fallen trees. Marble size hail also fell.

Cape May County

Countywide	16	0200EST			0	0	150K		Heavy Rain
		1600EST							

Cumberland County

Countywide	16	0200EST			0	0	1M		Heavy Rain
		1600EST							

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NEW JERSEY, South and Northwest

NJZ024>026	Eastern Cape May - Eastern Atlantic - Eastern Ocean								
	16	0200EST 1600EST			0	0	1.1M		Hurricane
Atlantic County									
Countywide	16	0300EST 1600EST			0	0	500K		Heavy Rain
Camden County									
Countywide	16	0800EST			0	0	7M		Flash Flood
	17	0300EST							
Gloucester County									
Countywide	16	0800EST 2000EST			0	0	5M		Flash Flood
Mercer County									
Countywide	16	0800EST			0	5	32M		Flash Flood
	18	0800EST							
Salem County									
Countywide	16	0800EST 2000EST			1	0	5M		Flash Flood
		M40IW							
Burlington County									
Countywide	16	0900EST			0	0	7M		Flash Flood
	19	1000EST							
Middlesex County									
Countywide	16	0900EST			0	72	28M		Flash Flood
	17	1600EST							
Monmouth County									
Countywide	16	0900EST 2000EST			0	0	7.5M		Flash Flood
Hunterdon County									
Countywide	16	1100EST			0	3	8.5M		Flash Flood
	17	0800EST							
Morris County									
Countywide	16	1100EST			0	6	30M		Flash Flood
	23	0600EST							
Ocean County									
Countywide	16	1100EST 2000EST			0	0	5.5M		Flash Flood
Somerset County									
Countywide	16	1100EST			2	100	358M		Flash Flood
	18	1700EST							
		M58PH, F85PH							
Sussex County									
Countywide	16	1200EST 2000EST			0	0	2.5M		Flash Flood
Warren County									
Countywide	16	1200EST 2000EST			0	0	7M		Flash Flood
NJZ001-007>010-012>013-015>023	Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May								
	16	1300EST 2300EST			0	2	4M		High Wind (G54)
NJZ016>019-021	Salem - Gloucester - Camden - Burlington - Cumberland								
	16	1400EST 2130EST			0	0			Tidal Flooding
NJZ014-024>026	Eastern Monmouth - Eastern Cape May - Eastern Atlantic - Eastern Ocean								
	16	1600EST 2200EST			0	0	500K		Tropical Storm

Hurricane Floyd battered New Jersey (especially the central and northern thirds) on September 16th and brought with it torrential and in some areas, unprecedented and record breaking rains and damaging winds. The hurricane will go down in history as the greatest natural disaster to ever effect the state of New Jersey to date. Preliminary damage estimates for the entire state were 1.1 billion dollars hitting Bergen and Somerset Counties the hardest. Manville and Bound Brook were hardest hit within Somerset County. Six persons died in the state; all drownings: two each in Somerset and Bergen Counties, one in Passaic County and one in Salem County. Hundreds were injured. The hurricane caused record breaking flooding in the Raritan River Basin as storm totals averaged around ten

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops		
Location	Date							Character of Storm	

NEW JERSEY, South and Northwest

caused record breaking flooding in the Raritan River Basin as storm totals averaged around ten inches. In spite of similar storm total amounts, the flooding in the Passaic River Basin did not exceed the record set in April of 1984, but reached as high as the third highest crest on record for some streams. Excluding the northeast part of the state, storm totals elsewhere in the state ranged from three to ten inches with the highest amounts in Mercer County. There were hundreds of rescues from creeks and trapped/submerged vehicles. Many people ignored barricades and became stranded in flood waters. About 26,000 persons in the state were evacuated, about half of them in Somerset and Bergen Counties. Statewide 78 homes, 105 apartments (all in Somerset County) and 75 businesses were destroyed. Statewide 3,900 homes, 1,208 apartments and 1,683 businesses suffered major damage defined as losing up to 50 percent of the property's value. Statewide 23,235 homes, 1,758 apartments and 1,043 businesses suffered minor damage defined as suffering more than \$10,000 in damage. Statewide 39,113 homes, 2,232 apartments and 2,183 businesses suffered some damage defined as losing greater than \$200 in damage. About 616,400 homes and businesses lost power throughout the state for up to five days. About 17,800 homes and businesses, mainly around Somerset County, did not have gas service for up to two weeks. About 500,000 persons in the Raritan Valley had to boil their water for eight days and not bathe as the flooding crippled the Elizabethtown Water Company's main water treatment plant in Bridgewater (Somerset County). With the plant off line, water pressure was also low. Some municipalities received little, if any, water. Other sewage treatment plants were so overwhelmed with runoff that many spewed raw sewage into the streams and rivers. Schools were closed on the 16th as Governor Christie Whitman declared a state of emergency. Service along Amtrak's Northeast Corridor was disrupted and not resumed until Saturday the 18th. Service on several New Jersey Transit Lines was not resumed until the work week of the 20th.

A 40-year-old man drowned in the Salem River near Pennsville Township in Salem County. An 85-year-old woman and her 58-year-old son drowned in Bound Brook (Somerset County) after they refused to evacuate and became trapped in their first floor apartment. The highest verifiable storm total was 14.45 inches in Pompton Lakes (Passaic County). Nearby Philadelphia International Airport not only set a new daily precipitation record of 6.63 inches, but also a new 24 hour record of 6.77 inches. Based on SKYWARN Spotter reports and Doppler Radar precipitation estimates, the area of heaviest rain coincided with the first significant rise in elevation in the northern half of the state around the Watchung Mountains. Doppler storm total estimates of 10 to 12 inches covered much of the eastern half of Hunterdon County, the western half of Somerset County, extreme eastern parts of Morris County and adjacent areas in Essex, Passaic and Union Counties. Lesser amounts fell in the rest of northwest New Jersey. Farther to the south, storm totals increased farther west in New Jersey with locations along the Delaware River receiving the heaviest amounts. Doppler Radar storm total estimates reached 10 inches in Salem and Mercer Counties. The torrential downpours associated with Hurricane Floyd exceeded the 100-year-flood return period in the Raritan Basin as several rivers and streams either set record or had their second highest crest on record. The combination of winds funneling into the Delaware Bay and the Delaware River and the record runoff from inland waterways produced minor to moderate tidal flooding at the times of high tide in Cumberland, Salem, Gloucester, Camden and Burlington Counties. Evacuations occurred in low-lying areas near the river. The evening (16th) high tide also slowed the discharge of streams into the Delaware. The highest wind gusts were mainly less than 60 mph. But, the combination of the heavy rain that loosened the ground and the persistence of the strong winds uprooted hundreds of trees. President Clinton declared Bergen, Essex, Mercer, Middlesex, Morris, Passaic, Somerset and Union Counties a disaster area. Homeowners in Hunterdon County were also eligible for damage assistance.

Hurricane Floyd began as a Cape Verde type hurricane east of the Lesser Antilles. As Floyd moved west, it passed to the north of and spared both the Greater and Lesser Antilles. Floyd intensified into a Category IV (Major) Hurricane on the Saffir-Simpson Scale. Floyd was a large sized hurricane that prolonged both the torrential rain and high winds. Floyd was heading for Florida before a turn to the northwest spared the state, but Floyd battered the Bahamas. The anticipated turn to the north and the northeast occurred on the 15th as Floyd was heading for North Carolina. Another important synoptic feature was a cold front that was over West Virginia on the 14th. This front stalled in Eastern Pennsylvania on the 15th. The stalled front not only failed to push offshore an already tropical and humid air mass that was over the state, but also acted as a conduit for the tropical moisture associated with Floyd. The moisture headed west toward the front, rising upward and dropped the heaviest rain in upslope areas of the state. Light rain associated with Floyd started in the state on the 15th. The torrential rain associated with Floyd arrived around 3 a.m. EDT in the southern part of the state and spread into Sussex County by 10 a.m. EDT. Floyd was just making landfall at the Mouth of Cape Fear or Bald Head Island in North Carolina as the heavy rain reached Mount Holly. Floyd started to accelerate northeast during the morning of the 16th. Some gusty winds arrived in the state during the morning of the 16th. A weakened (with respect to wind) Category One Floyd moved through Virginia Beach, Virginia and was back over the open Atlantic Ocean around noon on the 16th. Floyd continued to move northeast and the eye passed just east of the Virginia Capes and Fenwick Island, Delaware around 3 p.m. EDT. By the afternoon of the 16th all the torrential rain had moved north of Floyd and ended with the passage of the hurricane (on the same latitude line). During the afternoon of the 16th all of the sustained hurricane force winds were located over the Atlantic. At 5 p.m. EDT Floyd was downgraded to a tropical storm as it passed about 10 miles east of Atlantic City. Between 5 p.m. and 9 p.m. EDT the torrential rain ended across the state from south to north. The strongest winds associated with Floyd mixed down as cooler air behind the system moved into the region. For many locations the strongest wind gusts occurred between 4 p.m. and 10 p.m. EDT and the highest gusts occurred over higher terrain locations. Wind gusts rarely exceeded 50 mph, but all the flooding rains made it easier for trees to be knocked over. Tropical Storm Floyd made landfall again on western Fire Island in Suffolk County, New York around 8 p.m. EDT and was located near Portland, Maine at 8 a.m. EDT on the 17th.

Somerset County and Bound Brook and Manville specifically were hit the hardest (in the Mount Holly, NJ area of forecast and warning responsibility). Expressions such as "It's gone.", "It's totaled.", "It's like nothing we've seen before." were used to describe the flooding in downtown Bound Brook. About 2,000 persons were evacuated, 800 were rescued from second story windows and rooftops in the downtown and west end areas. The downtown was covered by an estimated thirteen feet of water. Flooding stretched

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops		

NEW JERSEY, South and Northwest

Flooding stretched from Tea Street to Billian-Legion Park and reached as high as High Street. Due to an electrical malfunction, a fire broke out in a cluster of stores on Main Street in Bound Brook. Flood waters prevented firefighters from getting close. Four stores were gutted, three others were heavily damaged. Borough schools were closed through the 24th. Main Street was not reopened until October 5th. More than 200 homes were condemned. Manville was hit equally as hard as 1,000 persons were evacuated from 360 homes in the Lost Valley section. In all 1,500 homes were damaged and 284 homes were condemned. The mud line was 10 feet above ground level. Both boroughs are along the Raritan River and the Raritan set new record crests at both locations breaking the previous record set during Tropical Storm Doria on August 28, 1971. Flood waters from the Raritan River also inundated the Elizabethtown Water Company's main water treatment plant in Bridgewater. About 500,000 customers in Hunterdon, Mercer, Middlesex and Somerset Counties were forced to boil their water and advised not to bathe. The plant tripping off line also produced low water pressure that affected numerous municipalities. The National Guard delivered more than 500,000 bottles of water. The plant started to pump some water on Monday the 20th, was back to one-third of capacity on the 23rd and cancelled the boiling advisory at 8 p.m. EDT on the 24th. Many schools and businesses could not open until an adequate and safe water supply returned. Flooding along the Green Brook pushed up to three feet of sewage contaminated flood waters into the first floor of Green Brook Township's Municipal Building. In Hillsborough Township 600 homes were damaged and 200 persons were evacuated along the Millstone and Neshanic Rivers. A rescue boat capsized while trying to rescue a man trapped in a tree for two hours. In Franklin Township, flood waters from the Raritan River reached 10 feet inside the buildings of the Zorapeth Community Church destroying 20,000 volumes of books in its Bible Institute. Damage here alone was estimated at 2.5 million dollars. Nearly every township had flooded roads and low-lying area evacuations. Many townships were effectively cut-off. Downed trees exacerbated the damage mainly in the northern part of the county. Seventy-five percent of all the bridges in the county were damaged. Eight bridges remained closed in Bedminster, Bound Brook, Hillsborough and Montgomery. Several of them were damaged from logs smashing into them. Four bridges remained closed on October 19th. Numerous waterways were contaminated with raw sewage, heating oil and other pollutants. A 58-year-old building inspector became ill with Legionnaire's Disease during the clean-up. About 4,400 persons were evacuated throughout the county, 60 persons were still in shelters on October 15th. Many businesses in downtown Bound Brook and Manville were not expected to reopen.

Farther downstream in Middlesex County the Raritan River flooding also took its toll. As the Raritan River was rising, the incoming high tide during the early morning of the 17th prevented it from discharging into the bay. Around the time of this high tide, the Raritan River caused the worst flooding in memory in Middlesex County. About 3,300 persons were sheltered as evacuations occurred in New Brunswick, Carteret, Dunellen, Edison, South Brunswick, South Plainfield and Woodbridge. In New Brunswick the Raritan river flooded over New Jersey State Route 18. Flood waters cascaded around the New Brunswick Homes and River Watch Apartment Complexes (about 1,000 persons were evacuated), the New Brunswick Police Department and the New Brunswick Municipal Court. Neither of the municipal buildings were used again. New Jersey State Route 18 opened the afternoon of the 18th. Three bridges were closed. The Delaware and Raritan Canal Locks, swing bridge and tow path were damaged. Severe flooding damage was reported in Highland Park, Middlesex Borough, Piscataway, South Plainfield and Woodbridge. In Middlesex Borough 500 homes were damaged and the damage estimate was 6 million dollars. In Woodbridge, flooded stores were not expected to be reopened for weeks. In Piscataway where damage estimates reached 5 million dollars, the Riverside, Mayflower and Birchview Apartment Complexes were severely flooded. Parks near the Raritan River were also badly damaged. In Edison, low water pressure problems associated with the Elizabethtown Water Treatment Plant resulted in little or no water for the township through the 20th. The National Guard was providing water. Numerous streams flooded throughout the county. By early afternoon 30 to 40 roads throughout the county were already closed with numerous water rescues from car tops taking place. Rutgers University canceled classes on both the 16th and 17th. Downed trees were reported in Metuchen and over 100 homes were damaged by flooding in Dunellen. Another affect of Floyd was the thousands of barrels and drums (some containing hazardous solvents and acids) were found bobbing in the waters of Raritan and Sandy Hook Bays and washed ashore on local beaches.

Upstream areas in the Raritan Basin did not fare much better. In Hunterdon County five homes were destroyed, 117 had major damage and 582 had minor damage. Two apartments suffered major damage and 7 suffered minor damage. Twenty-four businesses also were damaged. About 125 persons were evacuated. Five percent of all county roads were damaged and three bridges (In East Amwell, Franklin and Readington Townships) were expected to remain closed through mid November. Hardest hit was Lambertville, especially the south side of the city near Swan Creek. Nearly 100 homes were flooded and half the evacuations within the county occurred in this city. The flooding creek also cracked a water pipe leaving the south side of the city with no water. Elsewhere the elementary school was flooded with nearly two feet of water (damage estimate 1.1 million) as a creek behind the school overflowed. The school did not reopen until Tuesday September 28th. Other streams and rivers flooded in Alexandria, Califon, Frenchtown and Holland Townships. High winds also damaged two homes in Holland Township and vehicles in Frenchtown Borough.

Elsewhere in Northwest New Jersey, Morris County in the Passaic Basin was hit hard. It was one of the hardest hit counties with respect to wind damage in the state. Hundreds of trees were knocked down. About 1,500 persons were evacuated because of flooding. Numerous roads were closed including NJ State Routes 10 and 23, U.S. Route 46 and NJ State Route 53. The hardest hit municipalities were Pequannock and Lincoln Park along the Pompton River. Flooding caused an estimated 5.5 million dollars to two hundred fifty homes in Pequannock. One home collapsed and trapped two persons and a dog inside. They were rescued. Thirty-five roads alone in Pequannock were closed. Flooding along the Rockaway River caused evacuations in Denville and Dover. Three hundred homes were flooded in Dover. Flooding along the Whippany River forced the evacuation of 50 families in Morristown and closed 15 roads in Mendham Township. Serious flooding also occurred along the South Branch of the Raritan River in Washington Township, the Loantanka Brook in Harding Township and Terrace Lake in Butler Borough. Flooding caused the Allen Street Bridge to collapse in Netcong Borough. Numerous trees were knocked down in Boonton, Harding, Mendham, Netcong and Washington

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

NEW JERSEY, South and Northwest

trees were snapped. In Harding Township, 90 percent of the township lost power because of downed trees. Every house on one block of Millbrook Road had downed trees on it. School were closed through Friday the 17th throughout most of the county and New Jersey Transit Rail Service was not returned to full operations until Monday the 20th.

On a relative basis the effects of Floyd diminished across Warren and Sussex Counties. In Franklin Township in Warren County a trailer exploded after flood waters caused a short in the wiring of a propane stove and spread to the tanks outside. The trailer exploded, but no one was hurt since the trailer park was already evacuated because of flooding. About 38,000 homes and businesses lost power. Power was not fully restored until the 21st. Hardest hit were Byram Township, Frankford Township, Hopatcong Borough and the town of Newton. Flooding caused by Floyd contaminated municipal wells in Andover and Hampton Townships.

In Central New Jersey, Mercer County was hit the hardest and was also included in the disaster declaration. About 400 persons were evacuated in Ewing and Lawrence Townships and in Trenton. About 85 major roads were closed including sections of Interstate 95, U.S. Routes 1 and 130 and New Jersey State Route 33. Hundreds of water rescues from trapped vehicles occurred. In Trenton the worst flood damage occurred along the Assunpink Creek. Forty homes and three businesses were damaged on Mulberry Street, Dickinson Street and North Clinton Avenue. In Ewing Township, about 150 residents were evacuated from the Willow Creek Rehabilitation and Care Center. In Lawrence Township, six homes were badly damaged (condemned) by flood waters from the Delaware and Raritan Canal. Businesses, car dealerships and residents near the Shabakunk Creek also suffered flood damage. U.S. Route 1 buckled. In Princeton, schools were closed until Monday the 20th because of the combination of flood damage and water quality problems stemming from the Elizabethtown Water Company's Bridgewater treatment plant. High winds took their toll also. The chimney blew down onto the roof of the Imani Community Church. Pieces of the chimney crashed through the roof. The replacement cost was estimated at 1 million dollars.

In Monmouth County, the worst flooding related problems occurred around noon EDT as the torrential rain coincided with the high tide. The worst flooding was reported in Union Beach and bay areas of Middletown Township. Mandatory evacuations occurred in Union Beach (which became an island) and voluntary evacuations occurred in Middletown Township along the bay and near Compton's and Pew Creeks. New Jersey State Routes 35 and 36 were closed due to flooding. Farther inland, Manalapan Township was hardest hit with overflowing brooks that forced the closure of six roads and sandbagging of homes on Birmingham Road. The strongest winds occurred during the evening and blew down transformers, wires, tree limbs and several trees throughout the county. Coastal areas escaped with minimal damage: just some minor beach erosion and minor back bay flooding at times of high tide. Thousands of barrels and drums (some containing hazardous solvents and acids) were found bobbing in the waters of Raritan and Sandy Hook Bays and washed ashore on local beaches.

Across the southern half of New Jersey, the heaviest rain and the most widespread flooding occurred in townships along the Delaware River. Less rain and flooding occurred farther southeast with less urban and poor drainage flooding and only minor beach erosion and back bay flooding reported in Atlantic, Cape May and Ocean Counties. The worst flooding occurred along some of the larger waterways in the area (Cooper River in Camden County, Rancocas Creek in Burlington County) and along tidal sections of tributaries to the Delaware River. This peaked during the evening high tide as winds funneled into the bay and brought higher tidal departures and slowed the discharge of inland waterways. The high tide in Philadelphia reached 9.4 feet above mean lower low water at around 640 p.m. EDT. Moderate tidal flooding starts at 9.2 feet above mean lower low water. In Burlington County, some evacuations occurred in Riverside around the Delanco-Riverside Bridge. The bridge was also closed. Farther upstream along the Rancocas Creek the Centerton Bridge in Willingboro was closed. Voluntary evacuations also occurred along the Delaware River in Delran and roads near the Rancocas Creek were closed. Several evacuations also occurred along the Assicunk Creek in Burlington City. Creek flooding (mainly the Rancocas) occurred in Medford, Mount Holly and Westampton Townships. About 10 roads in the county were closed due to flooding. In Camden County the worst flooding occurred in Collingswood along U.S. Route 130 between the Airport Circle and Collings Avenue. Some homes were flooded and evacuated as raw sewage was present. Flooding from Floyd knocked out a state psychiatric hospital's wastewater treatment plant in Winslow Township. Downed trees damaged a home in Blackwood Township. In Gloucester County, about 40 persons were evacuated in Gibbstown after the Gibbstown Levee partially gave way and sent water from the Delaware River and Repaupo Creek into Gibbstown. In adjacent Logan Township, about 20 persons were evacuated near Floodgate Road. There were also additional voluntary evacuations in low-lying areas of both Logan and Monroe Townships. Sections of U.S. Route 130 were closed. One road collapsed in Woolwich Township and the torrential rain contributed to a fatal accident on the New Jersey Turnpike. In Salem County, tidal flooding occurred in Penns Grove. A 40-year-old man died when he fell into the Salem near Pennsville. Several dam failures occurred. In Cumberland County, 3,700 persons living in mobile home parks in Vineland were evacuated. Farmers also feared that the heavy rain would ruin the fall spinach crop. In Ocean County, elderly residents of Laurelton Gardens in Brick Township were evacuated after a creek flooded. Scattered trees and wires were knocked down throughout the county. A tree damaged a house in Toms River.

In Somerset County the Millstone River at Blackwells Mills crested at a RECORD BREAKING 21.0 feet at 345 a.m. EDT on the 17th. Flood stage is 9 feet and the river did not return to bankfull until 7p.m. EDT on the 18th. It was the first river to reach flood stage in the county at 1 p.m. EDT. Also in Somerset County, the North Branch of the Raritan River near Raritan crested at a RECORD BREAKING 18.8 feet at 11 p.m. EDT on the 16th. Flood stage is 10 feet. Farther downstream the Raritan River in Manville crested at a RECORD BREAKING 27.5 feet at midnight on the 17th. Flood stage is nearly half as low, 14 feet. In Bound Brook the Raritan River crested at a RECORD BREAKING 42.1 feet at 1030 p.m. EDT on the 16th. Flood stage is 28 feet. The previous record set during Tropical Storm Doria was 37.5 feet set on August 28, 1971. Flooding started at all of the three Raritan River points around 5 p.m. EDT. Upstream in Hunterdon County, the South Branch of the Raritan River in High Bridge crested at

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------	---------------------------------	---------------------------------	-------	--------------------

NEW JERSEY, South and Northwest

10.9 feet at Midnight EDT on the 17th. Flood stage is 10 feet. Farther downstream in Stanton, the South Branch of the Raritan River had its second highest crest on record, 13.9 feet at 8 p.m. EDT on the 16th. Flood stage is 8 feet. In the Passaic River Basin in Morris County, the Rockaway River above the Boonton Reservoir crested at 6.3 feet at 1215 a.m. EDT on the 17th. Flood stage is 5 feet. The Pompton River in Pompton Plains crested at its third highest ever at 21.0 feet at 3 a.m. EDT on the 17th. Flood stage is 16 feet. Along the main stem of the Passaic River, along the Somerset County/Morris County border, in Millington the Passaic crested at 8.8 feet at 3 a.m. EDT on the 17th. The estimated flood stage is 8 feet. In Chatham (Morris County), the Passaic River crested at 7.6 feet at 530 p.m. EDT on the 17th. Flood stage is 6 feet. In Pine Brook (Morris County), the Passaic River crested at 20.8 feet at 9 a.m. EDT on the 18th. Flood stage is estimated at 19 feet. This point remained above its estimated flood stage the longest in the Passaic Basin, the river did not return to bankfull until 7 a.m. EDT on the 23rd. In Mercer County, the Assumpink Creek in Trenton reached its 7 foot flood stage at 9 a.m. EDT on the 17th, the first gaged stream to hit flood stage that day. It crested at 13.9 feet at 1 a.m. EDT on the 17th, the second highest crest on record. In Burlington County, the North Branch of the Rancocas Creek in Pemberton crested at 3.2 feet at 9 p.m. EDT on the 17th. Flood stage is 2.7 feet. In Camden County, the Cooper River at Haddonfield crested at 3.9 feet at 5 p.m. EDT on the 16th. Flood stage is 2.8 feet. Highest reported wind gusts were 62 mph in Browns Mills (Burlington County), 58 mph at the Commodore Barry Bridge (Gloucester County), 52 mph in Luke's Bay (Atlantic County), Waretown (Ocean County) and Sandy Hook (Monmouth County), 47 mph in High Point (Sussex County), 44 mph in Trenton (Mercer County) and 40 mph in Millville (Cumberland County).

Precipitation storm totals (done from north to south with up to the four highest reported amounts per county) included: In Sussex County 8.50 inches in Highland Lakes, 8.15 inches in High Point, 8.00 inches in Wawayanda and 7.80 inches in Wantage. In Warren County 8.85 inches at the Belvidere Bridge, 8.01 inches in Blairstown and 7.10 inches in Columbia. In Morris County 10.67 inches in Pequannock, 10.02 inches in Lincoln Park and Gillette, 9.40 inches in Morristown and 9.36 inches in Netcong. In Hunterdon County 12.98 inches in White House Station, 10.00 inches in Wertsville, 9.52 inches in Flemington and 8.51 inches in Riegelsville. In Somerset County 12.64 inches in Somerville, 12.24 inches in North Plainfield, 10.50 inches in Millington and 10.05 inches in Neshanic. In Middlesex County 8.64 inches in Middlesex and 7.04 inches in New Brunswick. In Monmouth County 6.40 inches in Hazlet, 5.82 inches in Marlboro, 5.20 inches in Sandy Hook and 4.57 inches in Keansburg. In Mercer County 10.44 inches in Princeton, 10.10 inches in Trenton, 9.10 inches in Ewing and 8.90 inches in Windsor. In Burlington County 7.07 inches in Mount Laurel, 6.48 inches in New Lisbon, 6.32 inches in Willingboro and 6.20 inches in Mount Holly. In Ocean County 6.07 inches in Lakewood, 4.05 inches in Toms River, 3.18 inches in Beach Haven and 2.91 inches in Brant Beach. In Camden County 7.36 inches in Pennsauken, 6.06 inches in Cherry Hill and 6.02 inches in Somerdale. In Gloucester County 8.54 inches in Pitman, 7.80 inches in West Deptford, 7.60 inches in Washington Township and 7.24 inches in Verga. In Atlantic County 4.41 inches in Estell Manor, 4.37 inches in Folsom, 4.02 inches at the Atlantic City Marina and 3.98 inches in Mays Landing. In Salem County 7.96 inches in Woodstown. In Cumberland County 5.94 inches in Seabrook, 5.93 inches in Vineland and 5.78 inches at the Millville Airport. In Cape May County 3.93 inches in Belleplain, 3.12 inches in Wildwood, 3.06 inches in Cape May and 3.02 inches in Stone Harbor. Another unwanted side effect from Floyd was extra mosquitoes and this was compounded by the outbreak of West Nile Disease around New York City.

NJZ001-007>010-012>026

Sussex - Warren - Morris - Hunterdon - Somerset - Middlesex - Western Monmouth - Eastern Monmouth - Mercer - Salem - Gloucester - Camden - Burlington - Western Ocean - Cumberland - Western Atlantic - Western Cape May - Eastern Cape May - Eastern Atlantic - Eastern Ocean

30 2359EST 0 0 Unseasonably Wet

Courtesy of Hurricane Floyd, September 1999 went down as one of the wettest Septembers on record in New Jersey. The statewide average monthly rainfall of 9.39 inches was the second wettest September on record since 1895. County weighted monthly rainfall amounts were in double digits from Mercer and Middlesex Counties northward. On a county weighted average September monthly rainfall totals ranged from 7.1 inches in Cape May County to 12.5 inches in Somerset County and 14.1 inches in Passaic County. New all-time monthly precipitation records were set at both the nearby Lehigh Valley (11.57 inches) and Philadelphia (13.07 inches) International Airports. The 13.07 inches of rain also established a new all-time monthly precipitation record for Philadelphia. At the Atlantic City International Airport, the monthly rainfall total of 4.92 inches was the seventh wettest September on record.

NEW MEXICO, Central and North

Lincoln County

5 E Ruidoso Downs

12

1520MST

0

0

Hail (1.75)

1525MST

San Miguel County

Villanueva

12

1557MST

0

0

Hail (0.88)

Catron County

Datil

13

1230MST

0

0

3K

Hail (0.88)

Guests from Eagle Ranch reported hail that dented several cars.

Bernalillo County

7 NW Albuquerque

13

1615MST

0

0

Hail (1.50)

Sandoval County

Rio Rancho

13

1617MST

0

0

Hail (0.75)

Taos County

10 SW Red River

14

1200MST

0

1

Lightning

A 40 year North Carolina man hiking on Wheeler Peak fell 100 feet after being struck by lightning.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NEW MEXICO, Central and North

Roosevelt County

Portales 14 1815MST 0 0 Hail (1.75)

Roosevelt County

Portales 14 1820MST 0 0 Flash Flood
Three feet of water reported at US Highway 70 and State Highway 467 with several cars including police vehicles flooded.

Roosevelt County

Portales 14 1840MST 0 0 15K Thunderstorm Wind
1905MST
High winds downed power lines and ripped tim off several roofs in Portales.

Guadalupe County

4 N Newkirk 15 1715MST 0 0 Hail (0.88)

Roosevelt County

6 SW Portales 15 1915MST 0 0 200K Hail (0.75)
1930MST
Hail severely damage cotton crops near Portales.

NEW MEXICO, South Central and Southwest

Grant County

Silver City 13 1100MST 0 0 Hail (1.75)
1105MST

A severe thunderstorm produced hail up to golf ball size in the Silver City area. Smaller hail accumulated to a depth of six inches in Silver City and along N.M. route 90 south of Silver City.

Grant County

Silver City 13 1145MST 0 0 Flood
1600MST

Heavy thunderstorm rains caused widespread flooding and flash flooding in the Silver City area. As much as 2.4 inches of rain fell within 40 minutes. Flooding occurred along Pinos Altos Creek from the northeastern side of Silver City to the center of downtown Silver City. Several homes were flooded on the west side of the creek along with a number of parked cars. Roads along the creek were clogged with mud, rocks and debris rendering them impassable for a short time. The Silver City golf course had several cart paths washed out and much of the course was under water.

Grant County

2 S Silver City 13 1205MST 0 0 Thunderstorm Wind (G60)
1210MST

A severe thunderstorm produced a microburst that ripped a porch off a home.

NEW MEXICO, Southeast

Eddy County

Carlsbad 03 1645MST 0 0 5K Thunderstorm Wind
Strong outflow winds from a thunderstorm in Carlsbad knocked down several utility poles.

Lea County

1 E Hobbs 07 1515CST 0 0 15K Thunderstorm Wind
A collapsing thunderstorm produced damaging outflow winds in Hobbs that knocked down 12 telephone poles and several trees. Storage sheds blown over or destroyed as well.

NEW YORK, Central

NYZ009-015>018-022>025-036>037-044>046-055>057-062 Northern Onedia - Yates - Seneca - Southern Cayuga - Onondaga - Steuben - Schuyler - Chemung - Tompkins - Madison - Southern Oneida - Cortland - Chenango - Otsego - Tioga - Broome - Delaware - Sullivan

01 0000EST 0 0 50M Drought
30 2359EST

A very dry spring and summer caused major crop failures and some wells to run dry. Many streams and rivers were also brought to their lowest recorded levels. The crops most affected were corn and hay, which dealt a major blow to dairy farmers. According to preliminary figures from the New York State Department of Agriculture and Markets, the worst drought damage was reported in Cayuga (\$17.7 million), Steuben (\$15.3 million) and Madison (\$5.9 million) counties. September rains from the remnants of Hurricanes Dennis and Floyd helped to ease the summertime drought conditions although they came too late to help the vegetable and grain crops.

NYZ009-023-037-045>046-057-062 Northern Onedia - Schuyler - Southern Oneida - Chenango - Otsego - Delaware - Sullivan

16 1600EST 0 0 500.0K High Wind
17 0200EST

Strong and damaging winds plagued parts of central New York during the late afternoon and night as the remnants of Hurricane Floyd moved up the eastern seaboard. The strong winds began during the afternoon as the tropical system reached the New Jersey coast with blustery conditions lasting into early the next morning with persistent wind gusts estimated between 40 and 50 mph. Occasionally,

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

NEW YORK, Central

wind speeds reached 60 mph or more, especially in the Western Catskills.

The gale force winds caused considerable tree and powerline damage throughout the Western Catskills, with only scattered downed trees and sporadic power outages for the rest of central New York. Hardest hit areas were in Otsego, Delaware and Sullivan counties. More than sixty trees were uprooted in Sullivan county alone where a very large, approximately 200 year old tree, seriously damaged a residence at Bodin Lake. Numerous pleasure boats were sunk at a marina on Otsego Lake by the high winds and steep waves.

Chenango County Countywide

16	1800EST	0	0	Urban/Sml Stream Fld
17	0300EST			

Sullivan County Countywide

16	1800EST	0	0	Flood
17	0300EST			

Moisture associated with the remnants of Hurricane Floyd moved north along a frontal boundary that was stalled from eastern Pennsylvania to New England. Rain developed over central New York during the predawn hours and became heavy at times throughout the afternoon and night as "Floyd" continued up the east coast. Before the rain let up during the morning of the 17th, four to seven inches of rain was common in the Western Catskills with other rain amounts ranging from three to five inches in the Mohawk Valley and Susquehanna region of central New York, and just over two inches in the central Southern Tier and Finger Lakes regions.

Fortunately, due to the drought conditions that plagued the area over the summer months, these heavy amounts of rain were able to be efficiently absorbed by the parched topsoil. As a result, flooding was minor. No main stem river flooding occurred, but there were numerous accounts where small streams left there banks in Sullivan county producing several road washouts. A few roads were closed in Chenango county due to poor drainage flooding and ponding of water in low lying areas.

NEW YORK, Coastal

Orange County New Windsor to Newburgh

06	0600EST	0	0	Heavy Rain
	0800EST			

A narrow band of heavy showers accompanied by thunder produced from around 2 to 2 1/2 inches of rain in 2 hours. This caused standing water and some street flooding in communities from New Windsor north to just north of Newburgh.

This rainfall was associated with the remnants of tropical system Dennis, as it moved west of the area.

Suffolk County West Gilgo Beach to Bay Shr

08	0715EST	0	0	Flash Flood
	0745EST			

Orange County Southeast Portion

08	1500EST	0	0	Flash Flood
-----------	----------------	----------	----------	--------------------

Rockland County Northwest Portion

08	1500EST	0	0	Flash Flood
-----------	----------------	----------	----------	--------------------

A narrow band of slow-moving heavy showers and thunderstorms produced rainfall rates of at least 2 inches per hour, that caused significant street flooding. Cars stalled as water ponded to 2 1/2 feet in about 20 minutes along parts of Sunrise Highway near Lindenhurst.

As heavy showers and thunderstorms moved slowly east, they produced rainfall rates of at least 2 inches per hour. Aided by southeast winds, the heaviest rainfall occurred along the higher terrain of extreme southeast Orange County and extreme northwest Rockland County. In Rockland County, water accumulated up to 3 feet on Union and Stonehouse Roads in Spring Valley, where cars stalled. Several basements were flooded in the Pomona-Hillcrest-Monsey-Spring Valley corridor.

This rainfall was associated with the remnants of tropical system Dennis, as it moved west of the area.

Suffolk County Westhampton to Southampton

10	1500EST	0	0	Urban/Sml Stream Fld
-----------	----------------	----------	----------	-----------------------------

Heavy showers caused flooding of streets and low-lying poor drainage areas. Cars stalled and drivers were forced to abandon them in Southampton Village. Rainfall amounts ranged from 2.42 inches at Bridgehampton to 3.42 inches in Southampton.

Putnam County East Portion

21	1745EST	0	0	Flash Flood
-----------	----------------	----------	----------	--------------------

As a cold front approached the area, a line of heavy showers produced torrential rain that caused a small stream to overflow its' banks on Stoneleigh Avenue in Carmel.

Westchester County Hawthorne

25	0650EST	1	0	Lightning
-----------	----------------	----------	----------	------------------

As a cold front approached the area, a narrow line of showers and thunderstorms moved across the region. Lightning struck a gasoline tanker truck on Route 9A near the Saw Mill River Parkway in Hawthorne, which resulted in the death of the driver. M?VE

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
NEW YORK, East									
NYZ042>043-049>051-051>054-058>059-063>066			Warren - Washington - Eastern Schenectady - Southern Saratoga - Western Albany - Eastern Albany - Western Rensselaer - Eastern Rensselaer - Western Greene - Eastern Greene - Western Ulster - Eastern Ulster - Western Dutchess - Eastern Dutchess						
	16	1300EST			0	0	3.7M		High Wind
	17	1000EST							
Dutchess County									
Countywide	16	1600EST			0	0	900K		Flood
	17	0300EST							
Columbia County									
Countywide	16	1700EST			0	0	600K		Flood
	17	1200EST							
Greene County									
Countywide	16	1700EST			0	0	3M		Flood
	17	1500EST							
Rensselaer County									
Countywide	16	1819EST			0	0	1.5M		Flood
	17	0900EST							
Ulster County									
Countywide	16	1819EST			0	0	975K		Flood
	17	0800EST							
Albany County									
Countywide	16	1845EST			0	0	2.2M		Flood
	17	1000EST							
Dutchess County									
Wingdale	16	2030EST			1	0	100K		Flash Flood
	17	0200EST							
		F9PH							
Schenectady County									
Countywide	16	2030EST			0	0	920K		Flood
	17	1100EST							
Ulster County									
Saugerties	16	2219EST			0	0	100K		Flash Flood
	17	1200EST							
Schoharie County									
Countywide	16	2300EST			0	0	850K		Flood
	17	0800EST							
Schoharie County									
Gallupville	17	0224EST			0	0	50K		Flash Flood
		1600EST							

The remnants of Hurricane Floyd moved up the eastern seaboard on September 16 and during the early hours on September 17. The storm brought both high winds and exceptionally heavy rainfall to eastern New York, which included a large swath of 3 to 6 inch amounts. A frontal zone helped concentrate the heaviest rain just to the west of the Hudson Valley in the eastern Catskills and Helderbergs. Locally higher amounts of rainfall, exceeding a foot, fell in these areas. Specific rainfall amounts included 6.12 inches at Albany International Airport, the highest ever officially recorded from any given storm! Even higher amounts of rainfall included 8.15 inches in Delmar and 9 inches at Knox, both located in Albany County. 12.21 inches of rainfall was recorded in Cairo, Greene County, the most associated with the storm! The rain produced widespread flooding across the region, which proved very destructive and in one case, deadly. A nine-year-old girl in Wingdale, Dutchess County, drowned attempting to cross a flooded driveway, which had become a raging torrent. Significant flooding was noted on many smaller tributaries, including the Esopus, Catskill and Schoharie Creeks. The Normanskill in Albany rose to 13.5 feet, the second highest flood on record badly damaging homes in its vicinity. Coeymans Creek overflowed, forcing evacuation from 20 homes in Selkirk, Albany County. While the larger rivers did not generally exceed bankfull, heavy runoff pushed raw sewage into the Stockade section of Schenectady. In addition, rains not only flooded many roadways but washed out portions of them. One of these washouts was on Route 20 in Guilderland, between Willow Street and State Route 146. Seven families had to be evacuated from homes along Route 32 in Menands, Albany County. Many communities and counties declared a State of Emergency during the overnight of September 16 and 17. The rains, combined with left-over rain from Tropical Storm Dennis, a week earlier, alleviated the fourteen month drought across most of the region.

Winds from the passage of Floyd gusted to 49 mph at Albany International Airport during the evening of September 16. Higher gusts estimated over 60 mph were common across the hilltowns. The combination of the wind and very saturated ground, produced widespread downing of trees and power lines across much of eastern New York. The Wolf Pond Valley of northwest Warren County had wind gusts estimated as high as 80 mph. Hundreds, if not over a thousand trees were downed in a mile-long, 200-yard-wide swath in the narrow valley. Some of the trees fell on vehicles and houses across Eastern New York. One house was especially damaged in Rhinebeck, Dutchess County. The rain and wind produced massive power outages across the region. As many as 80,000 people lost power in the Mid Hudson Valley region, 54,000 in the Greater Capital District and another 25,000 in the Lake George Saratoga

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Property	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage			

September 1999

NEW YORK, East

region. Some individuals had to wait over a week for power to be restored. The storm resulted in lost wages , closed schools throughout the region, and cancelled flights at Albany International Airport.

Floyd resulted in the counties of Albany, Dutchess ,Greene and Rensselaer being declared "major disaster areas" by Governor

NEW YORK, North

NYZ035

Eastern Essex

16 2230EST

0 0 2M 25K High Wind

17 1200EST

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Approximately 10,000 people were without power. Trees were blown down blocking many area roads, and the Emergency Manager declared a state of emergency in the county Friday with schools closed. Especially hard hit were the towns of Moriah, Ticonderoga, Crown Point, Port Henry, Essex and Westport. Structural damage was reported in Mineville. Boat damage was reported at local marinas. Damage was reported to an apple orchard in Crown Point. Some food spoiled at local restaurants due to power outages. Rainfall associated with the remnants of Floyd across the area was 4 to 5 inches with locally higher amounts in the mountains.

NYZ034

Western Essex

17 0135EST

0 0 200K High Wind

1200EST

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down with numerous power outages. It was estimated that 2000 people were without power. Numerous trees were blown down in the North Elba and Lake Placid areas. A boat sank on Lake Placid due to the strong wind and waves. Rainfall across the area associated with the remnants of Floyd was 4 to 5 1/2 inches with locally higher amounts in the mountains.

NYZ031

Southwest Clinton

17 0200EST

0 0 50K High Wind

1200EST

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down with numerous power outages. A good deal of wind damage was reported in Saranac. Approximately 1000 people were without power Friday. Rainfall across the area associated with the remnants of Floyd was around 4 inches.

NYZ028

Northeast Clinton

17 0330EST

0 0 500K High Wind (G53)

1200EST

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down with an estimated 2000 without power. In Plattsburgh, a cable TV tower was blown on to the top of another building early Friday morning. Several boats were damaged along the shore of Lake Champlain. A radio station measured a peak gust of 53 knots (61 mph) in Plattsburgh. Damage was reported in the towns of Plattsburgh, Champlain, Altona and Chazy. Rainfall across the area associated with the remnants of Floyd was 3 1/2 to 4 1/2 inches.

Essex County
Lake Placid

17 0515EST

0 0 10K Flood

1000EST

The Mill Pond Dam in the Lake Placid area broke around 515 AM EST (615 AM EDT) with flooding of the Chubb River. Elsewhere in Essex county NY...some road flooding occurred during the morning in the North Elba area.

NEW YORK, West

NONE REPORTED.

NORTH CAROLINA, Central

NOT RECEIVED.

NORTH CAROLINA, Central Coastal

NCZ029-044>047-

Martin - Pitt - Washington - Tyrrell - Western Dare - Greene - Beaufort - Western Hyde - Duplin - Lenoir -

079>081-090>095-098-
103>104

Jones - Craven - Pamlico - Carteret - Onslow - Eastern Dare - Eastern Hyde

01 0000EST

0 0 21.3M 39.9M Tropical Storm

05 0412EST

On the evening of Tuesday, August 31st old Hurricane Dennis was downgraded to a Tropical Storm. By 0500 EDT Wednesday, September 1st Tropical Storm Dennis was located about 120 miles east of Cape Hatteras. The movement was nearly stationary with maximum sustained winds near 60 mph. By 1700 EDT Thursday, September 2nd the storm began moving slowly south with a

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NORTH CAROLINA, Central Coastal

position near 95 miles east southeast of Cape Hatteras. This trend continued until 1700 EDT Friday, September 3rd. Tropical Storm Dennis finally begin drifting, slowly west northwest. Landfall occurred on Saturday, September 4th around 1700 along the Core Banks just north of Cape Lookout. The storm then continued very slowly through eastern North Carolina. For almost a week after Tropical Storm Dennis made landfall, associated rain fell on our inland counties. This allowed most of the rivers to rise above flood stage which set the stage for the next hurricane, Hurricane Floyd and its associated record flooding.

For almost two weeks the Dennis battered the Outer Banks during one of our highest astronomical tide periods. In turn, beach erosion was extremely severe. The dune structure on Hatteras Island was breeched in numerous locations. That included the loss of a 3000 thousand foot long section of Highway 12 just north of Buxton and a new inlet along the Core Banks. Dennis also swallowed six homes along the northern Outer Banks in Rodanthe. The town of Nags Head estimated their dune loss at \$16.5 million.

Although total damage estimates have been included in this summary please reference August storm data statistics for specific Hurricane Dennis damages. The rest of this summary will focus only on Tropical Storm Dennis, September 4th. Ocean storm surges were 2 to 3 feet above normal. Along the Neuse and Pamlico Rivers...storm tides were about 6 to 8 feet above normal. Isolated areas estimated 8 to 10 feet above normal...especially in the Wichards Beach area. Beaufort and Craven County officials reported that several homes were inundated with water for the first time ever. Pamlico County believes this was there worst flooding in more than 65 years...especially in such areas as Lowland...Hobucken...Florence... Hortensville...Mesic...Stonewall...Pamlico...and Oriental. As with Hurricane Dennis eastern Carteret and Ocracoke Island displayed the heaviest rainfall estimates on the Doppler Radar. 2 to 5 inches of rainfall were estimated with isolated areas up to 8 inches. No fatalities were reported and no tornado or flash flood watches were issued during Tropical Storm Dennis. A tornado watch was issued on the 4th and a Flash Flood Watch and Special Marine Warning were issued on the 6th.

Martin County Williamston to Hamilton

14	1430EST	0	0	Flash Flood
	1630EST			

Initial outer rainbands of Hurricane Floyd caused excessive rainfall in Martin County. The Martin Emergency Manager, Tony Rogers reported that the town of Hamilton had received nearly 11 inches of rainfall in the past 6 hours...Oak City had 8 to 10 inches...Robersonville 7 to 8 inches...and Beargrass 6 to 8 inches. Many roads were flooded while creeks and streams were already swollen from Tropical Storm Dennis.

NCZ029-044>047- 079>081-090>095-098- 103>104

Martin - Pitt - Washington - Tyrrell - Western Dare - Greene - Beaufort - Western Hyde - Duplin - Lenoir - Jones - Craven - Pamlico - Carteret - Onslow - Eastern Dare - Eastern Hyde

14	2300EST	13	0	410.6M	413.6M	Hurricane
16	1300EST					

Hurricane Floyd caused the largest peace time evacuation in the nations history. He also caused massive record flooding across inland sections of eastern North Carolina. At one time Floyd was classified as a category 4 hurricane on the Saffir/Simpson scale and will likely be categorized as one of the nation's most costly hurricanes in the 20th century.

Tropical Depression number eight was detected by the National Hurricane Center at 1600 EST on September 7th. The broad center was nearly 1000 miles west of the Lesser Antilles. At that time the depression was moving toward the west at 14 mph with maximum sustained winds of 30 mph. Within 12 hours the depression gained strength, became a tropical storm, and was named Floyd. As it neared the Virgin Islands on the afternoon of September 10th just 415 miles west of San Juan, Floyd became a hurricane. Hurricane Floyd rapidly intensified and by the evening of September 12th was classified as a category 4 hurricane. The hurricane continued to intensify. At its peak on the morning of September 13th, the winds increased to 155 mph and the central pressure bottomed-out at 921 mb. The position was 525 miles east-southeast of Miami and moving west at 14 mph.

Fortunately for Floridians, Hurricane Floyd soon made the expected turn to the north. By 1700 EST on September 14th the entire North Carolina coast was under a hurricane watch and at midnight up-graded to a hurricane warning. That same night the first outer rainbands began affecting eastern North Carolina and in turn, reports of flooding began filtering into the National Weather Service office in Morehead City/Newport (MHX). At least 40 official shelters were open across the county warning area.

Severe weather and rainfall preceded landfall. By Wednesday night September 16th, 20 tornado warnings had been issued with over half being verified. The greatest rainfall estimates from the MHX Doppler radar were over Duplin...Jones...Lenoir...Greene...Pitt...Martin...Craven...and Onslow Counties. Estimates were near 6 to 10 inches with isolated areas of 12 to 15 inches. The greatest rainfall report was from a Cooperative observer in Washington...15.48 inches. Tyrrell...eastern Carteret...eastern Pamlico... Hyde...and Dare Counties all had estimates less than 3 inches.

Hurricane Floyd made landfall on the morning of September 16th near North Topsail Beach as a category 2 hurricane. The eye moved northeast over Jacksonville...New Bern...Washington...Plymouth and continued over the eastern shores of Virginia. As the hurricane moved over the eastern coast of North Carolina, it accelerated and weakened. It lost its tropical characteristics early on the 17th. The University of Oklahoma Doppler-On-Wheels (DOW) team was positioned at Topsail Beach. Around 0200 EST the DOW recorded a sustained wind of 81 mph with gusts to 105 mph. The peak inland report in the MHX 15-county warning area was 82 mph at Cherry Point Marine Corp Air Station (NKT). The peak offshore report was 96 mph at Duck Pier.

Similar to rainfall, the strongest ocean storm surges occurred west and northwest of the eye. Ocean storm surges were about 4 to 6 feet

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time	Path	Path	Number of		Estimated		Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	

NORTH CAROLINA, Central Coastal

above normal...generally affecting Onslow...Carteret...and Hyde Counties. This caused extensive beach erosion on the south facing beaches. Ocracoke Island officials reported at least 10 new dune breaks along Highway 12. In Carteret County Pine Knoll Shores lost some 50 feet of beach. Emerald Isle lost an average of 14 feet and 52 public beach access walkways. The Oceanana Pier on Atlantic Beach lost a 200 foot section and the remaining 200 foot section of Iron Steamer Pier that Hurricane Bonnie spared was also wiped out.

Along the Albemarle Sound...storm tides were about 5 to 6 feet above normal. The Pamlico River storm tides were around 6 to 8 feet above normal. Water levels were especially high in Hyde County...Sladesville and Scranton. Along the Neuse River storm tides were also near 6 to 8 feet above normal...especially in the Core Creek area.

Extreme flooding was experienced across most counties. Inland flooding exceeded Hurricane Bertha...Fran...Bonnie... and Dennis combined. Most counties reported their worst flooding ever. The Tar River in Greenville and the Neuse River in Kinston were nearly 15 feet above their flood stages of 13 and 14 feet, respectively. The Tar River remained above flood stage for nearly two weeks while the Neuse River remained above flood stage for over a month. The Northeast Cape Fear River in Chinquapin was 8 to 10 feet above the flood stage of 13 feet. The Roanoke River in Williamston rose to nearly 3 feet above its flood stage. Unbelievable numbers of homes were covered with water and over half a million customers throughout the county warning area were without power. In Greenville alone a 100 acre parcel of land would be needed to store all the mobile homes that were destroyed due to flooding. Unofficially the flooding from Hurricane Floyd has been compared to a 500 year flood. At least 13 fatalities have been reported during the event in the 15 county warning area. Unfortunately, a majority of the deaths could have been avoided had the victims not driven through flooded roadways. As with most hurricanes, inland flooding is now responsible for the largest percentage of fatalities. M55BO, M76VE, M63IW, M42VE, M70VE, M65IW, M54IW, M21IW, M86PH, M19IW, M26VE, M27VE, M43VE

Onslow County Gum Branch	15	1335EST 1350EST			0	0			Funnel Cloud
Funnel cloud spotted in Roads Town area on Gum Branch Road.									
Pitt County Greenville	15	1440EST	0.2	10	0	0			Tornado (F0)
Tornado spotted just east of Greenville.									
Pamlico County Arapahoe	15	1510EST			0	0			Funnel Cloud
Funnel cloud spotted just north of Arapahoe.									
Onslow County Sneads Ferry	15	1511EST	0.2	10	0	0			Tornado (F0)
Tornado reported near Sneads Ferry. It destroyed a pier and knocked down several large trees.									
Pamlico County Grantsboro	15	1515EST	0.2	10	0	0			Tornado (F0)
Tornado ripped off the top of a barn near Scotts Store Road in Grantsboro.									
Carteret County 3 W Salter Path	15	1540EST	2	20	0	0	300K		Tornado (F2)
Tornado touched down at Emerald Isle Point. 5 homes were damaged...2 received major damage while another 2 were destroyed.									
Carteret County Atlantic Beach	15	1635EST			0	0			Thunderstorm Wind (G70)
A wind gust of 80 mph was reported.									
Carteret County Harlowe	15	1655EST	3	35	0	0			Tornado (F1)
Tornado reported along the Newport River near Harlowe.									
Beaufort County Bath	15	1725EST			0	0			Waterspout
Waterspout reported in Bath Creek by 911 operator.									
Carteret County Atlantic Beach	15	1805EST	1.5	25	0	0			Tornado (F0)
Tornado touchdown reported by 911 operator.									
Washington County 4 S Creswell	15	1820EST	0.2	10	0	0			Tornado (F0)
Tornado reported at Lake Phelps and Shore Dr. It destroyed one mobile home.									
Hyde County Swanquarter	15	1825EST	0.2	10	0	0			Tornado (F0)
Tornado spotted just west of Swan Quarter.									
Pamlico County Bayboro	15	1831EST	0.2	10	0	0			Tornado (F0)
Pamlico County Hobucken	15	1840EST	10	50	0	0	700K		Tornado (F2)
This tornado moved over Hobucken and destroyed a mobile home, a house, tore the roof off of a school and severely damaged two									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

NORTH CAROLINA, Central Coastal

churches.

Craven County Wintergreen	15	1920EST	6	20	0	0			Tornado (F0)
Pamlico County Bayboro to Alliance	15	1935EST	2	20	0	0			Tornado (F0)

Tornado spotted near EOC and moved northwest to near Alliance.

Between 1108 and 2110 LST on Wednesday, September 15th the Morehead City/Newport office issued 20 tornado warnings. That is an average of two warnings per hour for ten hours. At least ten of the tornadoes were reported by spotters during the event. This tornadic event was the precursor to Hurricane Floyd which made landfall on Thursday, September 16th and caused record flooding across eastern North Carolina.

Beaufort County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Carteret County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Craven County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Duplin County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Greene County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Jones County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Lenoir County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Martin County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Onslow County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Pamlico County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Pitt County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood
Washington County Countywide	15 16	1613EST 0410EST			0	0			Flash Flood

In association with Hurricane Floyd, excessive rainfall fell across many counties in eastern North Carolina. Doppler radar estimated that areas west of a line from Beaufort to Columbia received 2 to 4 inches with local amounts of 6 to 10 inches. Many roads throughout eastern North Carolina were covered with water.

Beaufort County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Carteret County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Craven County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Duplin County Countywide	16	0351EST 1000EST			0	0			Flash Flood

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NORTH CAROLINA, Central Coastal

Greene County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Jones County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Lenoir County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Martin County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Onslow County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Pamlico County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Pitt County Countywide	16	0351EST 1000EST			0	0			Flash Flood
Washington County Countywide	16	0351EST 1000EST			0	0			Flash Flood

Heavy rains continued to fall over eastern North Carolina in association with Hurricane Floyd. Widespread heavy rain fell west of a line from Beaufort to Columbia. Doppler Radar estimated 4 to 8 inches of rain with local amounts of 6 to 10 inches. New River Marine Corp Air Station reported a storm total precipitation amount of 8.26 inches. Tropical Storm Dennis left most rivers and streams in eastern North Carolina swollen and near flood stage. The additional runoff from Hurricane Floyd produced some the worst flooding of the century. Many rivers rose to over 15 feet above flood stage.

Pitt County Countywide	27	1336EST 1530EST			0	0			Flash Flood
Pitt County East Portion	27	1600EST 1900EST			0	0			Flash Flood
Greene County Countywide	27	2150EST 2359EST			0	0			Flash Flood
Lenoir County Countywide	27	2150EST 2359EST			0	0			Flash Flood
Greene County Countywide	28	0007EST 0600EST			0	0			Flash Flood
Lenoir County Countywide	28	0007EST 0600EST			0	0			Flash Flood
Martin County Countywide	28	0108EST 0600EST			0	0			Flash Flood
Pitt County Countywide	28	0108EST 0600EST			0	0			Flash Flood
Greene County Countywide	28	0605EST 1000EST			0	0			Flash Flood
Lenoir County Countywide	28	0605EST 1000EST			0	0			Flash Flood
Martin County Countywide	28	0605EST 1000EST			0	0			Flash Flood

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NORTH CAROLINA, Central Coastal

Pitt County Countywide

**28 0605EST
1000EST 0 0 Flash Flood**

The combination of an advancing cold front and upper level trough produced adequate lift for extensive rainfall over eastern North Carolina. Additionally with southeast flow at the surface and southwest flow in the mid levels, moisture was able to converge...lift...and then fall over already saturated soil. River levels from Hurricane Floyd were still over ten feet above flood stage. Any rain that fell over this already saturated soil had no where to go. Doppler radar began showing heavy showers on the evening of Monday, September 27th. By 9 a.m. Tuesday 5 to 10 inches of rain had fell over the four counties. Lenoir County was hardest hit with over 10 inches falling in the northwest portion of the county. Greene County received the most wide-spread area of 5 inches or greater. The Cooperative observer in Snow Hill (Greene County) reported 7.24 inches of rainfall in 24 hours. In the end this only added to the extremely swollen Neuse River and Contentnea Creek.

Pitt County was the first to report flooded roadways Monday night with Lenoir...Greene...and Martin soon to follow. Flash flooding reports continued through early Tuesday morning. Numerous secondary roads were flooded and washed out. Greene County Emergency Management reported that most roads were affected...especially Highway 91, Highway 258, and Old Creek Road. Lenoir County reported extensive flooding along Highway 70 and in the LaGrange area.

NORTH CAROLINA, Extreme Southwest

NONE REPORTED.

NORTH CAROLINA, North Coastal

**NCZ015>017-030>032- Pasquotank - Camden - Western Currituck - Bertie - Chowan - Perquimans - Eastern Currituck
102**

**01 0000EST 0 0 35K Hurricane
05 2300EST**

Hurricane and Tropical Storm Dennis produced one of the most prolonged periods of tropical cyclone related conditions across northeast North Carolina, from August 30th through September 5th. The highest sustained wind speed recorded at the Elizabeth City Coast Guard Station (ECG) was 39 mph with gusts to 52 mph. A few trees and power lines were blown down across northeast North Carolina resulting in scattered power outages. Pasquotank, Camden and Chowan counties experienced approximately a 2 to 3 foot surge in the Albemarle Sound with some flooding in coastal sections of those counties. Also, a number of roads were flooded in Camden County, and the fire department was inundated for a time. Rainfall amounts generally ranged from 5 to 7 inches across northeast North Carolina and caused some street flooding. The lowest sea level pressure recorded at the Elizabeth City Coast Guard Station (ECG) was 1003.8 mb.

Gates County Gatesville

**01 0000EST 0 0 Heavy Rain
05 2300EST**

Hertford County Murfreesboro

**01 0000EST 0 0 Heavy Rain
05 2300EST**

Northampton County Jackson

**01 0000EST 0 0 Heavy Rain
05 2300EST**

Hurricane and Tropical Storm Dennis produced heavy rainfall across northeast North Carolina. The heaviest rain occurred on September 4th and 5th. Most of the area received between 4 and 6 inches of rain.

Bertie County Countywide

**07 0100EST 0 0 Flash Flood
0800EST**

Camden County Countywide

**07 0100EST 0 0 Flash Flood
0800EST**

Gates County Countywide

**07 0100EST 0 0 Flash Flood
0800EST**

Hertford County Countywide

**07 0100EST 0 0 Flash Flood
0800EST**

Pasquotank County Countywide

**07 0100EST 0 0 Flash Flood
0800EST**

A slow-moving line of thunderstorms with very heavy rains caused numerous flooded roads throughout the area, with some secondary roads impassable.

Gates County Gates

07 1620EST 0 0 Flash Flood
Several roads flooded out/closed.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NORTH CAROLINA, North Coastal

NCZ015>017-030>032- Pasquotank - Camden - Western Currituck - Bertie - Chowan - Perquimans - Eastern Currituck
102

15	1200EST				0	0	12.0M	63.4M	Hurricane
16	1700EST								

Hurricane Floyd was a Category 1 hurricane as it crossed the Wakefield WFO county warning area. Sustained tropical storm force winds with gusts to near hurricane force occurred over the northwest quadrant of the storm over interior portions of northeast North Carolina and along the coastal waters of the Wakefield marine area. The center of the storm crossed the county warning area along an Elizabeth City to Currituck county to Sandbridge Virginia Beach axis. The highest sustained wind speed recorded at the Elizabeth City Coast Guard Station (ECG) was 39 mph with gusts to 64 mph. Two confirmed tornadoes occurred in association with Floyd, both in northeast North Carolina. There were approximately several thousand persons evacuated and housed in several shelters from coastal jurisdictions. Hundreds of trees and power lines were blown down across northeast North Carolina, resulting in widespread power outages. Coastal Pasquotank and Camden counties experienced approximately a 5 to 6 foot surge in the Albemarle Sound, flooding coastal sections of those counties including the business district of downtown Elizabeth City. Chowan county experienced a 5 to 6 foot surge from the Albemarle Sound causing some flooding in Edenton. The lowest sea level pressure recorded at the Elizabeth City Coast Guard Station (ECG) was 968.5 mb.

Bertie County

Windsor	15	1840EST	0.5	50	0	0	2K		Tornado (F0)
---------	----	---------	-----	----	---	---	----	--	--------------

Small, brief tornado blew a large tree down onto a road. The tornado was witnessed by a citizen.

Bertie County Countywide

15	2015EST				1	0			Flood
19	2300EST								

M43VE

Gates County Countywide

15	2015EST				0	0	140K	5.9M	Flood
18	1200EST								

Hertford County Countywide

15	2015EST				0	0	7M	12.5M	Flood
18	1200EST								

Northampton County Countywide

16	0300EST				0	0	1.2M	20.3M	Flood
17	1200EST								

Camden County Countywide

16	0800EST				0	0			Flood
17	0800EST								

Chowan County Countywide

16	0800EST				0	0			Flood
17	0800EST								

Pasquotank County Countywide

16	0800EST				0	0			Flood
17	0800EST								

Perquimans County Countywide

16	0800EST				0	0			Flood
17	0800EST								

Very heavy rain from Hurricane Floyd, falling on soils saturated by heavy rain of the previous 3 weeks, produced widespread flooding and flash flooding across northeast North Carolina, from the Roanoke River eastward. Rainfall amounts ranged from near 6 inches in southeast Gates county, to as much as 18 inches in southwest Bertie county. Numerous roads were washed out due to flooding, and a number of high water rescues had to be conducted. Fortunately, only one person perished due to the flash flooding. Also, there were enormous structural/housing and agricultural/crop losses due to the flooding.

Perquimans County Durants Neck

15	2230EST	1	100	0	0	125K			Tornado (F1)
----	---------	---	-----	---	---	------	--	--	--------------

Two houses destroyed one half mile apart near the Albemarle Sound. Also, several other homes were damaged and trees were down.

NCZ012>014

Northampton - Hertford - Gates

16	0400EST				0	0	14K		High Wind
	1500EST								

Numerous trees and power lines were blown down across northeast North Carolina, resulting in widespread power outages.

NORTH CAROLINA, Northwest and North Central

NCZ001>006-018>020 Ashe - Alleghany - Surry - Stokes - Rockingham - Caswell - Watauga - Wilkes - Yadkin

01	0000EST				0	0			Drought
05	0100EST								

Dry conditions that began in July of 1998, subsided for several months during the later part of 1998 and the first part of 1999, returned in June of 1999 and continued in many areas through early September. In many areas, crops were damaged or destroyed. Water levels in creeks, streams, and rivers were very low. The drought ended in most areas with the arrival of heavy rain from the remnants of

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>NORTH CAROLINA, Northwest and North Central</u>									
hurricane Dennis on the 4th and 5th of September.									
NCZ003-005-018>019									
Surry - Rockingham - Watauga - Wilkes									
	15	2000EST			0	0	0		High Wind
	16	1030EST							
High winds from the remnants of Hurricane Floyd on the evening of the 15th and morning of the 16th downed many trees and powerlines. Several thousand people lost power for several hours.									
Caswell County									
3.5 SSW Hightowers	16	0500EST 0900EST			0	0			Flash Flood
Heavy rain on the 16th caused Hyco Creek to flash flood onto Gunn Poole Road, 3.5 miles south-southwest of Hightowers.									
Surry County									
3.5 NE Mt Airy	29	1718EST			0	0	0		Thunderstorm Wind
Surry County									
3.5 NE Mt Airy to	29	1720EST	2	40	0	0	150K		Tornado (F1)
5.5 NE Mt Airy		1724EST							
Surry County									
Mt Airy	29	2253EST			0	0	60K		Lightning
Thunderstorms during the early evening of the 29th produced damaging winds, damaging lightning, and spawned a tornado.									
Thunderstorm winds downed several trees 3.5 miles northeast of Mt Airy.									
Lightning struck a house, starting a fire that caused major damage.									
A thunderstorm spawned a tornado 3.5 miles northeast of Mt Airy in Surry County at 1720 EST. The tornado was periodically on the ground for about 2 miles, before dissipating 5.5 miles northeast of Mt Airy. The average width of the tornado was 40 yards wide, with a maximum width of 70 yards wide. The tornado destroyed a mobile home, a large carport and associated garage, damaged or destroyed several out buildings, tore a portion of a roof off of a house, caused minor damage to several other homes, killed several chickens, uprooted numerous trees, knocked down power poles and power lines, and broke off large tree limbs. Some of the debris from the tornado was carried up to 2 miles downstream. Wooden attic stairs, that likely weighed in excess of 80 pounds, were carried about a quarter of a mile downstream. Maximum winds were estimated to be from 100 to 110 miles an hour.									
Rockingham County									
3 N Reidsville to	30	0700EST			0	0			Urban/Sml Stream Fld
4 NE Reidsville		0830EST							
Heavy rain flooded portions of Wolf Island Creek from 3 miles north of Reidsville to 4 miles northeast of Reidsville.									
<u>NORTH CAROLINA, South Coastal</u>									
New Hanover County									
Castle Hayne	06	0644EST 0650EST			0	0			Thunderstorm Wind (G65)
At the Oxychem plant, a thunderstorm wind gust pushed a railroad car a short way down the track.									
Bladen County									
4 NW Clarkton to	06	1930EST			0	0	20K		Thunderstorm Wind (G75)
3 NW Clarkton		1945EST							
Downburst wind from a thunderstorm caused damage to the Twisted Hickory area. A tobacco barn and storage buildings were damaged. Many trees were damaged or downed onto power lines.									
New Hanover County									
Wilmington to	15	0315EST			0	0			Flood
Castle Hayne	16	1300EST							
Heavy rains from Hurricane Floyd accumulated around 20 inches and caused the worst flooding in county history. High water closed many roads and inundated low-lying areas.									
Pender County									
3 SE Burgaw	15	0624EST 0627EST	0.3	10	0	0			Tornado (F0)
Tornado observed by Sheriff, no damage. During initial rains from Hurricane Floyd.									
Brunswick County									
Leland to	15	0730EST			0	0			Flood
Ash	16	1300EST							
Heavy rains from Hurricane Floyd accumulated around 20 inches and caused the worst flooding in county history. Septic tanks and wells were affected. High water closed most roads, including US17, isolating many areas. A dam broke at Boiling Springs Lakes, inundating the area. The Lockwood Folly River flooded and rescues were necessary. The Waccamaw River rose more slowly in response to the rains, and evacuations were necessary by the 19th in the vicinity of the town of Ash. Along the Cape Fear River, the Goose Creek, Riegglewood and Blue Banks communities were affected.									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NORTH CAROLINA, South Coastal

Pender County

Hampstead to
Watha

15 0730EST
16 1300EST

0 0

Flood

Heavy rains from Hurricane Floyd accumulated around 20 inches and caused the worst flooding in county history. High water closed many roads and inundated low-lying areas for weeks. The NE Cape Fear River, Black Rivers and many smaller creeks flooded. Highway I-40 was closed, as were NC 210 and NC 53. Around 600 people were rescued from the flood waters.

New Hanover County

5 S Wilmington to
7 S Wilmington

15 0920EST
0930EST

2 10

0 0

Tornado (F0)

Observed by public and Sheriff - in initial rainbands from Hurricane Floyd. No damage reported.

New Hanover County

Murraysville

15 1420EST

0.2 10

0 0

Tornado (F0)

Reported by Emergency Management, associated with a rainband from Hurricane Floyd. No apparent damage.

Bladen County

Kelly to
Bladenboro

15 1430EST
16 1300EST

0 0

10M

Flood

Heavy rains from Hurricane Floyd accumulated around 20 inches and caused the worst flooding in county history. High water closed many roads including U.S. 701 and N.C. 210, 41, 53 and 87...isolating much of the area and inundating low-lying areas. The Kelly-Rowan area was affected first, and gradually more than 300 structures were flooded across the county. The Bladenboro business district had waist-deep water that affected 10 businesses and many residences. About 50% of the crops were lost, and hog waste contributed to pollution.

Columbus County

Bolton to
Cerro Gordo

15 1430EST
16 1300EST

1 1

30M

10M

Flood

Heavy rains from Hurricane Floyd accumulated around 12 inches in the western part and near 20 inches in the eastern part of the county, causing the worst flooding in county history. High water closed many roads, including newly completed U.S. 74/76, and inundated low-lying areas. Water in downtown Whiteville was 5 feet deep, necessitating rescues by boat. Lake Waccamaw rose to the highest level ever, covering piers and flooding homes. Downstream, 600 were evacuated from Crusoe Island. M65OU

Robeson County

Ornum to
Lumberton

16 0130EST
1300EST

0 0

Flood

Heavy rains from Hurricane Floyd accumulated 6 to 10 and caused flooding to low-lying areas. Over the next several days, the Lumber River crested on the 17th and again on the 22nd as that rain and then more rain forced the river to rise. This caused significant residential flooding in the Lumberton area and elsewhere along the river.

NCZ097-100>101

Pender - Brunswick - New Hanover

15 1700EST
16 0900EST

0 0

109M

4M

Hurricane

NCZ087-096-099

Robeson - Bladen - Columbus

15 2300EST
16 0600EST

0 0

High Wind (G65)

Hurricane Floyd, with wind gusts around 90 mph caused widespread downed trees and power outages. In Brunswick County, power was out to 95% of the county. The wind did major damage to the roof of Brunswick Community Hospital. Storm surge was 7 to 9 feet on the east side of the county and 3 to 6 feet further west. Ocean Crest Pier, Long Beach Pier and Sunset Beach Pier were hard hit. Ocean overwash was worst at Oak Island, where 4 miles with 100 oceanfront homes sustained \$23 million damage. Holden Beach sustained \$8.8 million damage, where 46 homes were condemned, many due to exposed septic tanks. Ocean Isle Beach suffered \$6 million damage, where 2 homes were knocked off foundations and 500 feet of roadway was lost, with 28 homes declared unsafe. Sunset Beach had \$1.25 million damage and lost half its dune and a road, isolating 75 homes. However, the heavy rains which accumulated around 20 inches caused the worst flooding in history. High water closed most roads, including US17, isolating many areas. A dam broke at Boiling Springs Lakes, inundating the area.

In New Hanover County, housing losses were near \$25 million - 8 homes were destroyed and more than 200 sustained major damage. Ocean storm surge was 9 to 10 feet, inundating barrier islands and causing extensive dune erosion. Record rainfall distinguished Floyd - the most rain ever in 24 hours at ILM airport (14.84") and a storm total 19.06", causing widespread flooding.

In Pender County, a 7 to 9 foot storm surge Beach damaged the barrier islands, eroding half the dune. However it was record rainfall with ensuing ponding and flooding of rivers that caused the most serious damage. The Northeast Cape Fear had the worst flood of the century, while that Black River flood was the worst since 1945. Largely due to flooding, more than 1000 homes suffered major damage and 200 more were condemned. More than 3000 hogs, 90,000 turkeys, and 200 cows were lost due to drowning. Animal waste and septic tanks added pollution to the flooding. Two human fatalities occurred as motorists drove into flooded parts of highways.

In Columbus and Bladen Counties, wind gusts were near 75 mph in the eastern parts of the counties, downing trees and power lines. More than 15 inches of rain caused widespread flooding.

In Robeson Hurricane Floyd caused wind gusts near 70 mph in eastern Robeson County, downing trees and power lines. Rainfall around 10 inches caused widespread flooding.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of Persons	Estimated Damage	Property	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)					

September 1999

NORTH CAROLINA, South Coastal

Pender County Wards Corner

28 0625EST
0915EST

0

0

Flood

Heavy morning rains measured more than 2 inches, causing already wet ditches to flood and send water over Piney Woods Road and Sinal Town Road.

NORTH CAROLINA, Southwest

NCZ033>037-048>059- Avery - Caldwell - Alexander - Iredell - Davie - Madison - Yancey - Mitchell - Swain - Haywood - Buncombe -
062>072-082 McDowell - Burke - Catawba - Rowan - Graham - Northern Jackson - Macon - Southern Jackson -
Transylvania - Henderson - Polk - Rutherford - Cleveland - Lincoln - Gaston - Mecklenburg - Cabarrus -
Union

01 0000EST

0

0

Drought

30 2359EST

Rainfall continued to be scarce across much of western North Carolina through the month of September, prolonging the drought conditions which existed all summer. However, some areas in the piedmont picked up some rain from the remnants of Hurricane Dennis early in the month and from Hurricane Floyd itself two weeks later. Although this rain brought some relief, more wells ran dry and many more areas began mandatory water restrictions.

Catawba County Conover

09 1350EST

0

0

Lightning

Catawba County Propst Xrds to Claremont

09 1500EST

0

0

Lightning

Cleveland County 3 S Boiling Spgs

09 1500EST

0

0

Hail (0.75)

Lincoln County Vale

09 1500EST

0

0

Lightning

Rowan County 5 W Salisbury to Spencer

09 1615EST
1620EST

0

0

Thunderstorm Wind (G50)

Cabarrus County Mt Pleasant

09 1640EST

0

0

30K

Thunderstorm Wind (G60)

A line of thunderstorms crossed the foothills and piedmont during the afternoon, producing a large amount of lightning, gusty winds and hail. A few storms became severe briefly as they produced dime size hail or damaging wind. A large oak tree was downed across power lines on Sherrills Ford Road west of Salisbury. Another tree was blown down and blocked a lane on Interstate 85 near Spencer. Three trees were downed in the Mt Pleasant vicinity and one house under construction was destroyed when collapsed by the wind. A combination of lightning activity and gusty winds near 50 mph at times caused scattered power outages and trees limbs to fall. These reports came mainly from southern Cleveland county through western Lincoln county and into Catawba county.

NCZ035-053>054-062- Alexander - Buncombe - McDowell - Macon - Transylvania - Henderson - Rutherford - Lincoln - Gaston -
064>065-067-069>071- Mecklenburg - Union
082

15 2000EST

0

1

High Wind (G45)

16 1500EST

A tight pressure gradient between powerful Hurricane Floyd across eastern North Carolina and strong high pressure over the Ohio Valley and Great Lakes pulled cooler and very dry air south across the mountains and foothills of North Carolina on strong north winds. Henderson and Transylvania counties were particularly hard hit as winds gusting over 50 mph at times downed numerous trees and power lines - some on homes and vehicles. A person was injured in a car while driving near Zirconia when a tree fell on the vehicle. A large tent providing shelter at a fair in Henderson county was damaged. Numerous brush fires that started were fanned by the high winds. The Asheville Regional airport reported winds sustained at 45 mph with gusts to 54 mph around 9 am EST on the 16th. The wind abated in the mountains around noon.

Farther east, especially near and east of Interstate 77, winds more directly associated with Hurricane Floyd caused scattered damage. Winds gusting between 35 and 45 mph downed some trees and power lines. Trees fell on structures in Bessemer City and Gastonia. A warehouse under construction in Lowesville (Lincoln county) was destroyed.

Cabarrus County Georgeville

29 1700EST

0

0

Funnel Cloud

Cabarrus County 8 SSW Mt Pleasant to 12 SSW Mt Pleasant

29 1700EST
2000EST

0

0

Flash Flood

Cabarrus County 7 SSW Mt Pleasant

29 1810EST

0

0

Thunderstorm Wind (G50)

Cabarrus County Georgeville

29 1814EST

0

0

Funnel Cloud

A weak boundary and a favorable shear profile was sufficient to produce 3 supercell thunderstorms in a row which tracked east

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

NORTH CAROLINA, Southwest

northeast across the Charlotte metro area and through Cabarrus county. Funnel clouds were observed with 2 of the storms across extreme eastern Cabarrus county. About 4 miles north of where one of the funnel clouds was seen, the severe thunderstorm produced damaging wind which blew down a half dozen trees. Flash flooding developed in the same areas of eastern Cabarrus county due to the repeat thunderstorms. Some roads were washed out and several major intersections were flooded.

NORTH DAKOTA, Central and West

NONE REPORTED.

NORTH DAKOTA, East

NDZ014>015

Benson - Ramsey

01 0000CST

0

0

100M

Flood

30 2359CST

After peaking at 1444.77 feet MSL in 1998, the 1999 Devils Lake lake level rose roughly another 2 feet and fluctuated around 1447.00 feet MSL. This presented more challenges and problems to the people surrounding the lake. For the town of Churchs Ferry, which is located on the Mauvis Coulee inlet to Devils Lake, people had to decide about the fate of the entire community. Floodwaters threatened to overtake the town, or most importantly, the sewers and sewage lagoons. After some meetings, the town decided to pursue a community-wide buyout plan. This will affect all 113 people in Churchs Ferry. The town of Minnewaukan, with 401 residents, was also facing some major decisions due to the rising lake. Basements and sewer lines were heaving from the high groundwater table. The town decided to hire an outside consultant to determine the status of the sewer system. For the city of Devils Lake, with a population of 7782, a dike on the south side of the city was completed. Like most of the people across the basin, they continued to hope for a longer term solution to the flooding problem, which would involve an outlet to the lake. Since Devils Lake is a closed basin, in order to control the level of the lake, a man made outlet would need to be made. The US Army Corps of Engineers finally decided to go ahead with the outlet plan using emergency funds. However, it will be several years before this is completed. In the meantime, the 3 state parks on the lake continue to suffer from the high levels of the lake. Many boat access points and campsites are under water. Many roads have been closed and others are under constant construction. One of the lone bright spots has been the sport of fishing, which is booming under the new habitat and lake space. The waterfowl populations surrounding the lake are also at all time record highs.

NDZ049-052

Ransom - Sargent

01 0000CST

0

0

Flood

04 2359CST

A swath of 4 to 6 inches of rain fell over 4 days, causing numerous problems to an area of southeast North Dakota that has struggled with high water for quite a few years. The rain flooded the streets of Gwinner, with 8 to 10 inches of water over the road to the Melroe plant.

Ransom County
Lisbon

01 0813CST

0

0

Hail (0.75)

OHIO, East

OHZ039>041-048>050-057>059-068>069 **Tuscarawas - Carroll - Columbiana - Coshocton - Harrison - Jefferson - Muskingum - Guernsey - Belmont - Noble - Monroe**

01 0000EST

0

0

Drought

30 2359EST

September rainfall for Eastern Ohio again averaged below normal, with the Palmer Drought Severity Index keeping the entire area under a moderate to severe drought. The Crop Moisture Index also showed abnormally dry conditions continuing across all of Eastern Ohio.

Jefferson County
Unionport

29 1450EST

0

0

3K

Thunderstorm Wind

Thunderstorm winds downed several trees and power lines.

Columbiana County
Salem

29 1530EST

0

0

3K

Thunderstorm Wind

Thunderstorm winds downed several trees.

OHIO, North

OHZ003-006>014-017>023-027>033-036>038-047 **Lucas - Wood - Ottawa - Sandusky - Erie - Lorain - Cuyahoga - Lake - Geauga - Ashtabula - Hancock - Seneca - Huron - Medina - Summit - Portage - Trumbull - Wyandot - Crawford - Richland - Ashland - Wayne - Stark - Mahoning - Marion - Morrow - Holmes - Knox**

01 0000EST

0

0

200M

Drought

30 2359EST

Drought conditions continued across most of northern Ohio during September. Widespread heavy rain occurred on the 29th but did little to help crop conditions. For the month, only 1.63 inches of rain fell in Mansfield making it the 9th driest September on record. Of the 1.63 inches, 1.14 inches fell on the 29th. Even with an inch of rain on the 29th, both Toledo and Cleveland finished with below two inches of rain for the month. Losses from reduced crop yields are estimated at \$200 million for northern Ohio alone.

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm
OHIO, North									
Wyandot County Upper Sandusky	06	1610EST			0	0			Funnel Cloud
									Law enforcement officials spotted a funnel cloud two miles northwest of Upper Sandusky moving southeast at approximately 15 mph. The funnel persisted for several minutes but did not ever come in contact with the ground.
Stark County Canton	06	1730EST			0	0	50K		Thunderstorm Wind
									Several trees downed. One tree landed on a house and garage. The house sustained broken windows and minor damage roof. The garage and an adjoining deck were destroyed.
Stark County Canton	06	1745EST 1815EST			0	0	20K		Flash Flood
									Up to two and one half inches of rain fell in about an hour causing street flooding throughout Canton. Two cars were trapped in three feet of water at the intersection of 15th Street and Yale Street.
Ottawa County Port Clinton	10	0830EST			0	0			Waterspout
									A waterspout was sighted on Lake Erie approximately 2 miles offshore from the Camp Perry military installation or about 10 miles northwest of Port Clinton. No damage was reported.
Lake County Mentor	10	0845EST			0	0			Waterspout
									A waterspout was sighted on Lake Erie approximately five miles offshore from Mentor. No damage was reported.
Lake County Redbird	16	1705EST			0	0			Waterspout
									A waterspout was sighted on Lake Erie just offshore from Redbird. No damage was reported.
Medina County Medina	29	1145EST			0	0	5K		Thunderstorm Wind
									Two trees downed on the southwest side of Medina.
Knox County Mt Vernon	29	1203EST			0	0	5K		Thunderstorm Wind
									Several large trees downed.
Wayne County Wooster	29	1210EST			0	0	10K		Thunderstorm Wind
									A large tree and several power poles were downed.
Ashland County Central Portion to Countywide	29	1215EST			0	0	15K		Thunderstorm Wind
									Trees downed in and around Ashland and also to the south of Jeromesville.
Holmes County Stillwell	29	1300EST			0	0	5K		Thunderstorm Wind
									Many trees downed in and around Stillwell.
Geauga County Chardon	29	1400EST			0	0	5K		Thunderstorm Wind
									Two trees downed just north of Chardon.
Lake County Madison	29	1405EST			0	0	200K		Thunderstorm Wind
									Several dozens trees downed. Seven homes suffered minor roof and structural damage from fallen trees. An additional home suffered major structural damage when a twelve ton tree fell on the roof of an upstairs bedroom. The roof over the bedroom was destroyed and one of the exterior walls was split by the tree. The split in the wall allowed heavy thunderstorms rains to spill into the ground level of the house causing significant water damage. The remaining walls of the home were bowed by the weight of the tree. Two barns and seven cars were also damaged by fallen trees.
Stark County Hartville	29	1432EST			0	0		15K	Hail (0.88)
Stark County Waynesburg	29	1500EST			0	0		5K	Hail (0.75)
Ashtabula County Countywide	29	1530EST			0	0	40K		Thunderstorm Wind
									Trees and power lines downed throughout the county. A fallen tree destroyed a car in Ashtabula.
Portage County Countywide	29	1530EST			0	0	10K		Thunderstorm Wind
									Trees downed throughout the county including several in Edinburg.
Trumbull County Niles	29	1545EST			0	0	10K		Thunderstorm Wind
									Several trees downed.

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property Crops	Character of Storm	
<u>OHIO, Northwest</u>									
Defiance County Ney	28	1820EST			0	0		Hail (0.75)	
<u>OHIO, Southeast</u>									
OHZ066>067-075>076- Perry - Morgan - Athens - Washington - Jackson - Vinton - Meigs - Gallia - Lawrence									
083>087	01 30	0000EST 2300EST			0	0		Drought	
Drought severity either increased, or remain about constant during the month. The rainfall during September was mostly between 1 to 2 inches. Yet, South Point of Lawrence County had even less rain, with just three quarters of an inch.									
<u>OHIO, Southwest</u>									
Franklin County (Cmh)Port Columbus A	29	1112EST			0	0	10K	Thunderstorm Wind (G52)	
Thunderstorm winds gusted to 61 mph at the Columbus International Airport knocking over a trailer which was on airport grounds. Trees were also knocked down near the airport in the town of Bexley.									
Franklin County Reynoldsburg	29	1125EST			0	0		Thunderstorm Wind (G52)	
Winds gusted to 61 mph as reported by a storm spotter.									
Ross County Chillicothe	29	1345EST			0	1		Lightning	
A man was struck by lightning and suffered injury.									
Ross County 3 NE Chillicothe	29	1400EST 1405EST			0	0	3K	Thunderstorm Wind (G50)	
Trees were knocked down across Rocky Road.									
<u>OKLAHOMA, Eastern</u>									
Craig County Bluejacket	04	1750CST			0	0	2K	Thunderstorm Wind	
Power lines were blown down in Bluejacket.									
Nowata County 8 E Lenapah	04	1800CST			0	0	15K	Thunderstorm Wind	
Roofs were blown off several barns, and several trees were blown down.									
Scattered thunderstorms developed on the afternoon of Sept. 4 well in advance of a cold front moving south through Kansas. These thunderstorms produced isolated reports of small-scale severe winds in Nowata and Craig Counties.									
Le Flore County 12 E Talihina	07	1500CST			0	0		Hail (1.00)	
Le Flore County Heavener	07	1532CST			0	0		Hail (0.75)	
Creek County Silver City	07	1545CST 1605CST			0	0		Hail (1.00)	
A single storm back-built over Silver City, causing hail as large as quarters to last for 20 minutes in Silver City.									
Osage County Webb City	07	1608CST 1613CST			0	0		Hail (0.88)	
Pawnee County Terlton	07	1610CST			0	0		Hail (1.00)	
Pawnee County Cleveland	07	1619CST			0	0		Hail (1.00)	
Pawnee County 5 S Cleveland	07	1620CST			0	0		Hail (0.75)	
Location: along US Hwy 412									
Osage County Tallant to Nelagoney	07	1705CST 1715CST			0	0		Hail (2.00)	
There was a report of 1" hail at Tallant at 605 PM and a report of 2" hail at Nelagoney at 615 PM CDT.									
Osage County 3 N Hominy	07	1719CST			0	0		Thunderstorm Wind (G57)	
Osage County 5 W Skiatook	07	1737CST			0	0		Thunderstorm Wind (G57)	

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured		Estimated Damage Property Crops	Character of Storm	
<u>OKLAHOMA, Eastern</u>									
Washington County Vera	07	1755CST			0	0		Thunderstorm Wind (G52)	
Cherokee County Welling	07	1800CST			0	0		Hail (1.00)	
Rogers County Talala	07	1800CST			0	0	0.20K	Thunderstorm Wind	
Tree limbs as large as 6-8" in diameter were blown down in Talala.									
Nowata County Lenapah	07	1805CST			0	0	0.10K	Thunderstorm Wind	
Large tree branches were blown down.									
Tulsa County Skiatook	07	1810CST			0	0	0.10K	Thunderstorm Wind	
Tree limbs were blown onto the main highway in Skiatook.									
Cherokee County 2 NE Eldon	07	1822CST			0	0		Hail (0.75)	
Adair County Proctor	07	1825CST			0	0		Hail (0.75)	
Pawnee County Pawnee	07	1830CST			0	0	2.5K	Thunderstorm Wind (G61)	
Numerous large tree limbs and severe power lines were blown down by winds estimated at 60-70 mph.									
Tulsa County Owasso	07	1830CST			0	0	2K	Thunderstorm Wind	
Power lines were blown down.									
Delaware County 4 W West Siloam Spgs	07	1840CST			0	0		Hail (1.75)	
Craig County Vinita	07	1854CST			0	0	15K	Thunderstorm Wind	
The roof was blown off of a business in Vinita, and many trees and power lines were blown down.									
Cherokee County 10 NNE Tahlequah	07	1900CST			0	0	0.10K	Thunderstorm Wind	
Large tree limbs were blown down at the Eagle Bluff Resort.									
Craig County 9 SE Vinita	07	1900CST			0	0		Thunderstorm Wind (G52)	
Delaware County 3 SSW Cleora to 2 SSW Cleora	07	1900CST 1901CST			0	0	2K	Thunderstorm Wind (G61)	
Winds estimated at 65 miles an hour blew down power lines.									
Adair County Christie	07	1910CST			0	0	0.10K	Thunderstorm Wind	
Large tree limbs were blown down near Christie.									
Rogers County Tiawah	07	1910CST			0	0	15K	Thunderstorm Wind	
A motor home was blown over onto a propane tank, and large tree limbs were blown down.									
Cherokee County 4 NE Scraper	07	1915CST 2015CST			0	0		Flash Flood	
Black Fox Creek overflowed onto OK Hwy 10.									
Delaware County Grove	07	1915CST			0	0	0.50K	Thunderstorm Wind	
Several large trees were blown onto and blocked nearby roadways.									
Pawnee County Maramec	07	1915CST			0	0		Thunderstorm Wind (G52)	
Delaware County Zena	07	1920CST			0	0		Hail (0.75)	
Creek County 11 N Bristow to Bristow	07	1925CST 1939CST			0	0	0.30K	Thunderstorm Wind (G61)	
At 825 PM CDT, spotters reported 65 mph winds 11 miles north of Bristow near the intersection of OK Hwys 48 and 33. At 832 PM CDT, spotters reported trees blown down in a field 5 miles northwest of Bristow. At 839 PM CDT, spotters estimated 70 mph winds near Bristow.									
Delaware County 3 W Colcord	07	1933CST			0	0		Hail (0.75)	

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
OKLAHOMA, Eastern									
Creek County 3 NNE Kellyville	07	1943CST			0	0			Thunderstorm Wind (G52)
Adair County Christie	07	1945CST 2045CST			0	0			Flash Flood
Tributaries of the Baron Fork Creek near Christie overflowed their banks.									
Creek County Shamrock	07	1946CST			0	0			Hail (0.75)
Creek County Shamrock	07	1946CST			0	0			Thunderstorm Wind (G52)
Tulsa County 12 SE Tulsa	07	2015CST			0	0	0.10K		Thunderstorm Wind
Four-inch tree limbs were blown down in the Shadow Ridge Addition near 91st Street South and Mingo in Tulsa.									
Muskogee County Ft Gibson	07	2100CST			0	0			Thunderstorm Wind (G52)
Mcintosh County Checotah	07	2105CST			0	0	8K		Thunderstorm Wind
A tree was blown onto a car in Checotah.									
A southward-moving cold front kicked off scattered severe thunderstorms during the heat of the afternoon over areas northwest of Tulsa, while an isolated severe thunderstorm in southern Le Flore County was caused by differential heating over higher terrain. Individual cells eventually evolved into a nearly solid line of thunderstorms that was responsible for locally damaging winds in northeast Oklahoma. The line eventually weakened below severe limits as it moved southward and approached Interstate 40.									
Tulsa County 4 SE Tulsa to 3 E Tulsa	10	1255CST 1320CST			0	0			Hail (0.88)
There were several reports of large hail from near downtown Tulsa to the midtown area...they are:									
		Time (CDT)	Location			Size			
		155 PM	Harvard and BA Expwy			.75"			
		200 PM	31st St. S. and Yale			.88"			
		220 PM	11th St. S. and Yale			.88"			
Tulsa County 8 SE Tulsa to 13 SE Tulsa	10	1304CST 1316CST			0	0			Thunderstorm Wind (G61)
There were numerous reports of strong winds in southcentral and southeast Tulsa. The worst damage was centered near 91st Street South and Memorial. Following is a summary of individual reports...At 200 PM CDT, there was a gust to 70 mph at 71st Street South and Lewis. At 204 PM CDT, there was a gust to 70 mph at 71st Street South and Memorial. At 212 PM CDT, there was a gust to 60 mph at 81st Street South and Memorial. At 216 PM CDT, there was a gust to 70 mph at 71st Street South and Mingo. Large tree limbs were blown down throughout the southern part of the city of Tulsa roughly south of 51st Street South. However, numerous trees were blown down along 91st Street South between Memorial and Mingo, including one large tree that blocked 91st Street for several hours.									
Tulsa County 9 SE Tulsa to 3 W Broken Arrow	10	1312CST			0	0			Hail (0.88)
There were several reports of large hail along the 81st Street corridor in southeast Tulsa and western Broken Arrow. At 212 PM CDT, there was a report of nickel-sized hail at 81st Street South and Memorial in Tulsa. At 220 PM CDT, there was a report of dime-sized hail at 81st Street South and 125th East Avenue in Broken Arrow.									
Wagoner County 4 N Broken Arrow	10	1325CST			0	0			Thunderstorm Wind (G52)
Location: 41st Street South and 193rd East Avenue in Broken Arrow									
Wagoner County 2 S Broken Arrow	10	1330CST			0	0			Hail (0.75)
Location: 101st Street South and 193rd East Avenue in Broken Arrow									
Wagoner County Coweta	10	1330CST			0	0	25K		Thunderstorm Wind
A tree was blown onto a house in Coweta. Winds also toppled an extensive speaker system at the grandstand of an outdoor festival in Coweta, destroying the speakers.									
Muskogee County Haskell	10	1340CST			0	0			Hail (1.00)
Muskogee County Jamesville	10	1407CST			0	0			Hail (0.75)
Okmulgee County 1 E Bald Hill	10	1410CST			0	0			Hail (1.00)

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

OKLAHOMA, Eastern

Muskogee County
Muskogee Davis Arpt 10 1425CST 0 0 Thunderstorm Wind (G52)

Mcintosh County
Hitchita 10 1440CST 0 0 Thunderstorm Wind (G52)

Muskogee County
2 W Webbers Falls 10 1450CST 0 0 Thunderstorm Wind (G61)

Mcintosh County
Checotah to 10 1458CST 0 0 Hail (0.75)
7 SW Checotah 1520CST

Pawnee County
6 W Maramec 10 1530CST 0 0 Thunderstorm Wind (G52)

Haskell County
Stigler 10 1538CST 0 0 Thunderstorm Wind (G52)

Creek County
Oilton 10 1600CST 0 0 0.10K Thunderstorm Wind
Large tree limbs were blown down.

Haskell County
Lequire 10 1600CST 0 0 Thunderstorm Wind (G52)

Creek County
1 S Shamrock 10 1652CST 0 0 Hail (0.75)

Creek County
1.5 NW Bristow to 10 1704CST 0 0 Hail (2.50)
Bristow 1705CST
There was a report of 2.5" hail northwest of Bristow, and there was another report of 1" hail in Bristow.

Okfuskee County
3 N Paden 10 1710CST 0 0 0.50K Thunderstorm Wind
Trees were blown down north of Paden.

Creek County
3 NW Bristow 10 1715CST 0 0 Hail (1.50)

Okfuskee County
3 W Welty 10 1730CST 0 0 Hail (1.00)

Okfuskee County
3 N Castle to 10 1747CST 3.5 150 0 0 80K Tornado (F1)
2 E Castle

An F1 tornado touched down about 3 miles north of Castle, travelling approximately 3.5 miles southeast before lifting about 2 miles east of Castle. Along the way, this storm completely ripped the roof from one permanent wood-frame house about 2 miles northeast of Castle, and it blew the roof off of a mobile home located on OK Hwy 48 north of Castle near I.X.L. Another residence immediately to the south sustained minor damage when a tree fell on the corner of the house. The house's owner said that she witnessed a white funnel about 100 yards to the northeast. Several barns were completely destroyed, leaving only hay bales that were once covered by the barns.

Okfuskee County
Okemah 10 1758CST 0 0 25K Lightning

A house in Okemah was struck by lightning, igniting the back portion of the house and destroying the back portion of the residence.

Okfuskee County
Okemah to 10 1800CST 0 0 200K Hail (2.75)
Clearview 1820CST

There were several reports of large hail from Okemah to Clearview. Following are individual reports:

Time (CDT)	Location	Size
700 PM	Okemah	.88"
707 PM	Okemah	1"
710 PM	3 E Okemah	2.75"
715 PM	Okemah	1.75"
720 PM	Clearview	1"

The hail in Okemah broke and cracked windows in several residences, and many vehicles sustained hail damage.

Okfuskee County
Castle to 10 1810CST 0 0 6K Thunderstorm Wind (G70)
Weleetka 1830CST

There were several reports of damaging and severe thunderstorm winds from Castle, east-southeast through Okemah, to Weleetka. Starting in Castle, many trees were damaged, including a 125-foot tall cottonwood tree that was uprooted. Down the road in Okemah, numerous trees, tree limbs and several power lines were blown down. Three miles east of Okemah, an Oklahoma mesonet site measured a wind gust to 80 miles an hour at 715 PM CDT. In Weleetka, large trees were blown down.

Severe thunderstorms developed early on the afternoon of Sept. 10 as warm, moist low-level air returned following several days of

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

OKLAHOMA, Eastern

cooler, drier weather. Severe weather initially developed over the Tulsa metro area with the emphasis shifting south to Haskell County by early evening. The afternoon convection then left an outflow boundary over northcentral Oklahoma that was the focus for more severe thunderstorms as an upper level disturbance approached in the evening. This second round of storms slipped southeast along the outflow boundary from Pawnee County to Okfuskee County. The worst storm of the day was the last storm of the day...a supercell that moved east-southeast along the outflow boundary in Okfuskee County, producing a damaging tornado, damaging baseball-sized hail, and 80 mph winds.

Osage County West Portion

12	0300CST 0400CST	0	0	Flash Flood
----	--------------------	---	---	-------------

Water covered many county roads in low spots.

OKLAHOMA, Extreme Southeast

NONE REPORTED.

OKLAHOMA, Panhandle

Texas County

Hooker	12	0010CST	0	0	Hail (1.00)
--------	----	---------	---	---	-------------

Beaver County

5 W Forgan	12	0017CST	0	0	Hail (0.88)
------------	----	---------	---	---	-------------

Beaver County

2 SW Beaver	12	0030CST	0	0	Hail (1.75)
-------------	----	---------	---	---	-------------

Beaver County

2 N Beaver	12	0030CST	0	0	Hail (1.00)
------------	----	---------	---	---	-------------

Beaver County

1 SW Beaver	12	0030CST	0	0	Thunderstorm Wind (G53)
-------------	----	---------	---	---	-------------------------

Beaver County

1 NW Beaver	12	0035CST	0	0	Hail (1.75)
-------------	----	---------	---	---	-------------

Beaver County

1 W Beaver	12	0035CST	0	0	Thunderstorm Wind (G52)
------------	----	---------	---	---	-------------------------

Beaver County

1 SW Beaver	12	0035CST	0	0	Thunderstorm Wind (G68)
-------------	----	---------	---	---	-------------------------

Beaver County

Beaver	12	0037CST	0	0	8M Thunderstorm Wind (G70)
--------	----	---------	---	---	----------------------------

Damage reported to be six and a half million dollars in structural damage and one and a half million dollars in damage to vehicles. Fourteen hundred homes in Beaver were damaged with two homes completely destroyed and twenty-three homes deemed to be unlivable. There were no injuries from the storm.

Beaver County

Beaver	12	0038CST	0	0	Hail (1.75)
--------	----	---------	---	---	-------------

Beaver County

8 W Slapout	12	0105CST	0	0	Thunderstorm Wind (G52)
-------------	----	---------	---	---	-------------------------

Beaver County

8 W Slapout	12	0110CST	0	0	Thunderstorm Wind (G70)
-------------	----	---------	---	---	-------------------------

Severe thunderstorms with devastating winds and large hail pounded the eastern and parts of the central Oklahoma panhandle during the early morning hours.

OKLAHOMA, Western, Central and Southeast

Ellis County

8 SW Arnett	03	1425CST	0	0	Thunderstorm Wind (G61)
-------------	----	---------	---	---	-------------------------

McClain County

Blanchard	04	1545CST	0	0	0.20K Thunderstorm Wind (G52)
-----------	----	---------	---	---	-------------------------------

Pontotoc County

Ada	04	1700CST	0	0	0.50K Thunderstorm Wind
-----	----	---------	---	---	-------------------------

Scattered thunderstorms developed during the afternoon of the 4th across portions of central Oklahoma, producing isolated severe wind gusts. In Blanchard in McClain County, a wooden fence was blown down. Numerous trees were blown down in Ada in Pontotoc County, where a sign was also blown down in the north part of town.

Cleveland County

3 S Stella	07	1340CST	0	0	Hail (1.00)
------------	----	---------	---	---	-------------

Pottawatomie County

4 W Macomb	07	1415CST	0	0	Hail (0.88)
------------	----	---------	---	---	-------------

Garfield County

1 E Enid	07	1425CST	0	0	Hail (0.88)
----------	----	---------	---	---	-------------

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Damage	
Character of Storm									
OKLAHOMA, Western, Central and Southeast									
Kay County Peckham	07	1443CST			0	0			Hail (0.75)
Garfield County Waukomis	07	1445CST			0	0			Hail (0.88)
Kay County Newkirk	07	1450CST			0	0			Hail (0.88)
Kay County 3 N Newkirk	07	1455CST			0	0	0.50K		Thunderstorm Wind
Kiowa County Hobart	07	1520CST			0	0			Thunderstorm Wind (G50)
Kiowa County 4 E Hobart	07	1525CST			0	0			Hail (1.00)
Kiowa County Hobart	07	1525CST			0	0			Thunderstorm Wind (G50)
Payne County 17 WSW Stillwater	07	1559CST			0	0			Hail (0.88)
Garfield County 4 SE Enid	07	1635CST			0	0			Hail (0.75)
Pottawatomie County 5 NW Macomb	07	1650CST			0	0			Hail (1.00)
Alfalfa County 9 NE Byron	07	1720CST			0	0	0.01K		Thunderstorm Wind
Garfield County 2 N Fairmont	07	1720CST			0	0			Hail (0.88)
Grant County Manchester	07	1735CST			0	0			Hail (0.75)
Garfield County 3 SE Breckinridge	07	1750CST			0	0			Thunderstorm Wind (G51)
Garfield County 2 N Fairmont	07	1750CST			0	0			Hail (0.88)
Garfield County Garber	07	1758CST			0	0	0.50K		Thunderstorm Wind (G61)
Kay County 3 E Ponca City	07	1800CST			0	0	2K		Lightning
Garfield County 2 N Covington	07	1804CST			0	0			Hail (1.00)
Garfield County Covington	07	1835CST			0	0			Hail (0.88)
Garfield County Covington	07	1835CST			0	0			Thunderstorm Wind (G52)
Garfield County Kremlin	07	1840CST			0	0			Thunderstorm Wind (G52)
Logan County Marshall	07	1840CST			0	0			Thunderstorm Wind (G52)
Garfield County 3 SE Breckinridge	07	1900CST			0	0			Thunderstorm Wind (G55)
Major County 8 E Ringwood	07	1900CST			0	0			Thunderstorm Wind (G51)
Logan County 3 SE Marshall	07	1905CST			0	0			Thunderstorm Wind (G63)
Major County 8 E Ringwood	07	1905CST			0	0			Thunderstorm Wind (G53)
Logan County 3 SE Marshall	07	1910CST			0	0			Thunderstorm Wind (G55)
Logan County Crescent	07	1930CST			0	0	22K		Thunderstorm Wind
Logan County Mulhall	07	1930CST			0	0	0.01K		Thunderstorm Wind (G52)
Garfield County Enid	07	1933CST			0	0			Hail (0.88)

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured		Estimated Damage Property Crops	Character of Storm	
<u>OKLAHOMA, Western, Central and Southeast</u>									
Logan County 4 SW Guthrie	07	2020CST			0	0		Thunderstorm Wind (G52)	
Payne County 7 E Cushing	07	2100CST			0	0	4K	Lightning	
Lincoln County 5 W Agra	07	2110CST			0	0	0.01K	Thunderstorm Wind	
Cleveland County Norman	07	2315CST			0	0		Hail (0.75)	
Hail was reported on the south side of Norman.									
Oklahoma County Edmond	07	2320CST			0	0		Thunderstorm Wind (G67)	
Pottawatomie County Shawnee	08	0100CST			0	0	0.10K	Thunderstorm Wind	
Scattered severe thunderstorms developed from the afternoon of the 7th through the early morning hours of the 8th across portions of northern, central, and southwest Oklahoma. In Logan County, a mobile home was destroyed, and the roof of a business was damaged in the town of Crescent. In Pottawatomie County, a large tree was blown down in Shawnee near Bob Crouch Drive. Large tree limbs were reported down 9 miles northeast of Byron in Alfalfa County, 5 miles west of Agra in Lincoln County, in Mulhall in Logan County, and in Garber in Garfield County, where power lines were also reported down. Power lines were also reported down in Kay County, 3 miles north of Newkirk. Lightning ignited fires at a home 3 miles east of Ponca City in Kay County and at Mid-Continent Pipeline, located 7 miles east of Cushing in Payne County, where two tank batteries were damaged.									
Payne County Glencoe	10	1515CST			0	0		Hail (1.00)	
Harper County 6 SE Buffalo	10	1530CST			0	0		Hail (0.75)	
Woods County 4 W Plainview	10	1540CST			0	0		Thunderstorm Wind (G52)	
Woods County 16 NE Freedom	10	1545CST			0	0		Thunderstorm Wind (G55)	
Woods County 16 NE Freedom	10	1550CST			0	0		Thunderstorm Wind (G56)	
Harper County 5 S Lovedale	10	1605CST			0	0		Hail (0.75)	
Carter County 4 N Healdton	10	1630CST			0	0		Thunderstorm Wind (G52)	
Major County 8 E Ringwood	10	1640CST			0	0		Thunderstorm Wind (G56)	
Garfield County Lahoma	10	1645CST			0	0		Hail (0.75)	
Murray County 3 W Davis	10	1700CST			0	0	7K	Thunderstorm Wind	
Murray County Davis	10	1700CST			0	0	25K	Thunderstorm Wind (G56)	
Carter County 5 NE Ardmore	10	1730CST			0	0		Thunderstorm Wind (G52)	
Pontotoc County 1 N Byng	10	1730CST			0	0	0.50K	Thunderstorm Wind	
Carter County 2 NE Gene Autry	10	1745CST			0	0	2M	Thunderstorm Wind (G89)	
Carter County Ardmore	10	1750CST			0	0		Thunderstorm Wind (G55)	
Major County Ames	10	1755CST 1757CST	1	15	0	0	0	Tornado (F0)	
Major County 3 W Ames	10	1755CST 1800CST			0	0		Thunderstorm Wind (G52)	
Blaine County Okeene	10	1800CST			0	0		Thunderstorm Wind (G52)	
Garfield County Enid	10	1800CST			0	0	0.50K	Thunderstorm Wind	

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	Character of Storm	
<u>OKLAHOMA, Western, Central and Southeast</u>									
Dewey County 1 S Taloga	10	1808CST			0	0	30K	Thunderstorm Wind (G70)	
Major County 5 SE Ringwood	10	1820CST			0	0		Thunderstorm Wind (G52)	
Beckham County 3 ESE Mayfield	10	1840CST			0	0		Thunderstorm Wind (G52)	
Beckham County 4 S Elk City	10	1845CST			0	0		Thunderstorm Wind (G56)	
Hughes County Dustin	10	1855CST			0	0		Hail (0.75)	
Canadian County Yukon	10	2000CST			0	0	15K	Thunderstorm Wind	
Canadian County 4 ESE Yukon	10	2030CST			0	0	20K	Thunderstorm Wind	
Oklahoma County Edmond	10	2030CST			0	2	7K	Lightning	
Oklahoma County Oklahoma City	10	2030CST			0	0		Thunderstorm Wind (G52)	
The gust was reported at the intersection of Interstate 40 and MacArthur Road.									
Oklahoma County Edmond	10	2045CST			0	0		Urban/Sml Stream Fld	
Pontotoc County 10 N Ada	10	2240CST			0	0	2K	Thunderstorm Wind	
Seminole County Sasakwa	10	2250CST			0	0	0.50K	Thunderstorm Wind	
Pontotoc County 2 S Fittstown	10	2300CST			0	0	0.50K	Thunderstorm Wind	
Scattered severe thunderstorms developed during the afternoon and evening of the 10th over portions of northwest, central, and southern Oklahoma. One tornado was reported and was captured on video in Ames in Major County, by a student from the University of Oklahoma. The tornado traveled a distance of 1 mile, but caused no damage (F0). Straight-line winds caused damage at the Ardmore Industrial Park in Carter County 2 miles northeast of Gene Autry, where a gust of 89 knots (102 mph) was measured. One aircraft hangar was completely destroyed. Several aircraft were overturned, and three were destroyed. A man suffered a broken back and tailbone when attempting to right an overturned plane. Several other hangars and buildings received roof damage, including the control tower, a newly completed office building, the airpark fire station, and the Ardmore Truck Driving School. Damage was estimated at 2 million dollars.									
In Murray County just west of Davis, a large sign was blown down at the Chickasaw Trading Post, and an awning and several cars were damaged at the Snak-Shak. In Davis, numerous power lines and trees were reported down. The roof of a home was torn off, and the Gordon White Lumber Company also received heavy roof and siding damage.									
Other reports of wind damage included a 300 foot communications tower that was blown down one mile south of Taloga in Dewey County, where a home also received roof damage. In Canadian County, downed trees, power lines, fences, and roof damage were reported throughout the western and southern portions of Yukon. Signs were blown down and a trailer was overturned on Interstate 40 in the vicinity of Yukon. In Pontotoc County, power line poles were reported down 10 miles north of Ada, while power lines were blown down near Byng and 2 miles south of Fittstown. Power lines were also reported down in Enid (on the 1000 block of North Van Buren Street) in Garfield County and in Sasakwa in Seminole County.									
In Oklahoma County, lightning struck a barn in Edmond, causing a portion of the barn to explode, scattering debris onto an occupied car parked along I-35. The driver of the vehicle and one passenger received cuts and bruises. Elsewhere in Edmond, heavy rains resulted in the flooding of Second Street underneath a railroad overpass. This area was blocked off after a vehicle stalled in four feet of water.									
Comanche County Cache	11	2230CST			0	0		Hail (1.00)	
Comanche County 3 E Cache	11	2230CST			0	0		Hail (0.75)	
Comanche County Cache	11	2230CST			0	0		Thunderstorm Wind (G52)	
Cotton County 4 S Hulen	11	2249CST			0	0		Hail (0.75)	
Comanche County Cache	11	2315CST			0	0		Hail (1.00)	

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
OKLAHOMA, Western, Central and Southeast									
Tillman County									
7 N Loveland	12	0027CST			0	0			Hail (1.00)
Tillman County									
5 NE Loveland	12	0042CST			0	0			Hail (1.00)
Ellis County									
Gage	12	0156CST			0	0			Thunderstorm Wind (G57)
Woodward County									
Woodward	12	0205CST			0	0	15K		Thunderstorm Wind
Woodward County									
7 W Woodward	12	0215CST			0	0			Hail (1.75)
Woodward County									
7 W Woodward	12	0215CST			0	0			Thunderstorm Wind (G74)
Woods County									
2 SW Waynoka	12	0220CST			0	0			Thunderstorm Wind (G53)
Woodward County									
Mooreland	12	0230CST			0	0	200K		Thunderstorm Wind (G70)
Garfield County									
Waukomis	12	0340CST			0	0	150K		Lightning
Isolated severe thunderstorms developed in the late evening of the 11th and the early morning hours of the 12th in western Oklahoma, producing very strong winds, especially in northwest Oklahoma. Most of the damage was confined to Woodward and Mooreland in Woodward County. Numerous trees and power line poles were reported down in Woodward, including an 80-foot transmission pole that was snapped off at the corner of 11th Street and Main, resulting in loss of power to 6000 customers. In Mooreland, a cooling tower was heavily damaged at the Western Farmers Electric Cooperative, and 2 trailers were blown over at Curry Dozer Service, while a 12-foot cinderblock fence was blown over in another part of town. In Waukomis in Garfield County, lightning struck a house, igniting a fire which destroyed about two-thirds of the house.									
Roger Mills County									
6 NW Reydon	19	1645CST			0	0			Hail (0.75)
Roger Mills County									
Reydon	19	1645CST			0	0			Hail (0.75)
Roger Mills County									
4 SW Dempsey	19	1725CST			0	0			Hail (1.75)
Beckham County									
5 NNE Mayfield	19	1730CST			0	0			Hail (1.75)
Beckham County									
3 NNW Sayre	19	1810CST			0	0			Hail (0.75)
Beckham County									
3 NNW Sayre	19	1810CST			0	0			Thunderstorm Wind (G52)
Canadian County									
3 SW Union City	19	1845CST			0	0			Hail (0.75)
Grady County									
Minco	19	1905CST			0	0			Hail (1.00)
Grady County									
4 NE Middleberg to 4 NW Middleberg	19	1955CST			0	0			Hail (0.88)
Mcclain County									
Blanchard	19	1955CST			0	0			Hail (0.88)
Garfield County									
2 S Hunter	19	2024CST			0	0			Hail (1.00)
Mcclain County									
6 SSW Washington	19	2030CST			0	0			Thunderstorm Wind (G56)
Garfield County									
2 S Hunter	19	2040CST			0	0			Hail (0.88)
Garfield County									
8 NE Garber	19	2115CST			0	0			Hail (1.00)
Noble County									
1 W Billings	19	2115CST			0	0			Hail (1.00)
Noble County									
4 SE Billings	19	2150CST			0	0			Hail (0.75)
Garfield County									
4 W Hunter	19	2157CST			0	0			Hail (0.88)

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

OKLAHOMA, Western, Central and Southeast

Beckham County

4 N Sayre 24 1832CST 0 0 Hail (1.00)

Greer County

Willow 24 1900CST 0 0 Hail (1.25)

Kiowa County

3 SE Cooperton 24 2210CST 0 0 Hail (1.25)

Oklahoma County

Oklahoma City 24 2215CST 0 2 Lightning

Two adults were injured after being struck by lightning at the State Fair Arena.

Pontotoc County

Oakman 25 0530CST 0 0 25K Lightning

Lightning struck two oil tank batteries, igniting a fire.

OREGON, Central and East

ORZ016>017

01 0000PST 0 0 Drought

30 0000PST

An almost complete lack of rainfall for the entire month of September has worsened a drought that has affected the Columbia Basin and the foothills of the Blue Mountains for much of the year. Pendleton, in the heart of Oregon's dryland farming region, has received only 0.01 inch of rain in September. For the year, 5.6 inches of rain has fallen. A normal year through September would have received 8 inches. The lack of soil moisture has delayed the planting of winter wheat. A scientist at the Agricultural Research Station stated that the acreage planted so far this fall is only 10 percent of normal.

ORZ014

25 0105PST 0 0 High Wind (G74)

A spotter reported sustained winds of 85 mph at the East Butte lookout tower.

ORZ016>017

25 0740PST 8 33 1M High Wind

1500PST

A strong Pacific cold front associated with a deep low pressure system north of Washington State brought strong winds over Oregon and Washington during the morning and early afternoon. These high winds raised clouds of dust over the Columbia basin, reducing visibilities to less than a quarter mile over Umatilla and Morrow counties. At around 9:30 am PST, blowing dust caused several chain reaction accidents on Interstate 84 nine miles west of Pendleton. This dust was caused by winds that gusted as high as 53 mph, which was recorded at the Pendleton Airport's ASOS site. These accidents involved up to 50 automobiles and semi-trucks on both the east and westbound lanes and led to the closure of the Interstate for 10 hours. Six people were killed and dozens were injured in these accidents. Another accident with a fatality occurred at 10:48 am PST at exit 216, which is six miles east of Pendleton. During the day, the Dept of Transportation also closed State Highways 11 and 37; both of which lead from Pendleton. F52VE, M64VE, M69VE, F79VE, M37VE, M54VE, M52VE, F68VE

ORZ017

25 0740PST 0 0 1K High Wind

Strong winds blew over a trailer and some outbuildings across from the forecast office in Pendleton. A roof was also damaged.

ORZ013

Cascades In Lane County

25 1100PST 0 0 High Wind (G69)

80 mph wind gusts reported in Dufur in Wasco county.

ORZ019

25 1130PST 0 0 1K High Wind

High winds knocked out power briefly to several towns in the Grande Ronde valley. 7000 people lost power in the towns of La Grande, Elgin and Imbler.

ORZ013

Cascades In Lane County

25 1251PST 0 0 High Wind (G58)

A spotter reported wind of 67 mph 10 miles NW of Terrebonne at an elevation of 2800 ft.

OREGON, Northwest

NONE REPORTED.

OREGON, Southeast

NONE REPORTED.

OREGON, Southwest

ORZ015

01 0001PST 0 0 Extreme Cold

0800PST

See below.

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time	Path	Path	Number of		Estimated		Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	

OREGON, Southwest

A Frost warning was issued for this zone at 0440 PDT on 08/31/99 and expired at 0800 PDT on 09/01/99.

Reported low temperatures were in the middle 20s to middle 30s. Frost was not reported, but probably did occur. Three stations reported lows that were well below normal. The Paisley low was 28, 17 degrees below normal, the Silver Lake low was 25, 15 degrees below normal, and the Sprague River low was 19, 18 degrees below normal. Such abnormally low temperatures were probably not widespread.

ORZ015

01 1635PST 0 0 Extreme Cold

02 0800PST

See below.

Reported low temperatures ranged from the middle 20s to middle 40s. Although no frost was reported, some probably did occur this morning.

ORZ015

02 1655PST 0 0 Extreme Cold

03 0800PST

See below.

Reported low temperatures this morning ranged from the lower 20s to middle 30s. Although no frost was reported, some probably did occur. The Lakeview low (28), the Sprague River low (20), and the Malin low (29) were all 16 degrees below normal. A Freeze Warning probably should have been issued, but was not.

Coos County Countywide

07 0300PST 0 0 Wild/Forest Fire

1153PST

See below

Curry County Countywide

07 0300PST 0 0 Wild/Forest Fire

1153PST

See below.

Jackson County Countywide

07 0300PST 0 0 Wild/Forest Fire

1153PST

See below.

Josephine County Countywide

07 0300PST 0 0 Wild/Forest Fire

1153PST

See below.

A Red Flag Warning was issued for ridges in these counties. Strong east winds and low humidities were expected. It wound up improving earlier than expected. No major fires developed during this time.

Coos County Countywide

10 1500PST 0 0 Wild/Forest Fire

12 0130PST

See below.

Curry County Countywide

10 1500PST 0 0 Wild/Forest Fire

12 0130PST

See below.

Josephine County Countywide

10 1500PST 0 0 Wild/Forest Fire

12 0130PST

See below.

A Red Flag Warning was issued for the above counties. Gusty east winds and low humidities were expected. No major fires developed during the warning.

Coos County Countywide

25 1545PST 0 0 Wild/Forest Fire

29 1300PST

See below

Curry County Countywide

25 1545PST 0 0 Wild/Forest Fire

29 1300PST

See below.

Jackson County Countywide

25 1545PST 0 0 Wild/Forest Fire

29 1300PST

See below.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

OREGON, Southwest

Josephine County Countywide

25 1545PST 0 0 Wild/Forest Fire
29 1300PST

See below.

A Red Flag Warning was issued for the above areas. Gusty east winds and low humidities were expected and did occur. A fire developed near Brookings in Curry county toward the end of the warning period.

ORZ015

26 1420PST 0 0 Extreme Cold
27 0800PST

See below.

Reported low temperatures were in the middle teens to lower 30s. No frost was reported, but it probably did occur. The Silver Lake low was 18 degrees, which was 15 degrees below normal. However, temperatures this abnormally cold were likely not widespread.

ORZ007>008-015

Central Willamette Valley - Southern Willamette Valley
27 0511PST 0 0 Extreme Cold
28 0800PST

See below.

Reported low temperatures were in the 30s and below. No frost was reported, but it probably did occur.

Coos County Countywide

30 1500PST 0 0 Wild/Forest Fire
2359PST

See below.

Curry County Countywide

30 1500PST 0 0 Wild/Forest Fire
2359PST

See below.

Douglas County Countywide

30 1500PST 0 0 Wild/Forest Fire
2359PST

See below.

Jackson County Countywide

30 1500PST 0 0 Wild/Forest Fire
2359PST

See below.

Josephine County Countywide

30 1500PST 0 0 Wild/Forest Fire
2359PST

See below.

A Red Flag Warning was issued for the above counties (only west portion of Jackson county was included) for gusty northeast winds and low humidities. The warning continued into October.

PACIFIC

Guam Central Portion

02 1200SST 0 0 Urban/Sml Stream Fld
1400SST

Light winds combined with daytime heating caused heavy showers to develop over the inland sections of Guam. The rainfall amount recorded at the National Weather Service Office at Tiyan between 1000 and 1600 was 1.22 inches with the heaviest occurring between 1200 and 1400.

Guam Inarajan to Umatac

03 1800SST 0 0 Urban/Sml Stream Fld
2000SST

Heavy rainshowers passed over the southern section of Guam. The villages of Umatac and Merizo reported that streets and roads were flooded for a few hours.

Guam Central Portion

07 0000SST 0 0 Urban/Sml Stream Fld
0400SST

Showers brought a brief period of heavy rain to parts of the island of Guam with 0.74 of an inch of rain falling between midnight and 4 am at the National Weather Service Office at Tiyan.

Guam Countywide

08 1000SST 0 0 Urban/Sml Stream Fld
1200SST

Slow moving showers brought a period of heavy rain to the island. An automated weather station near Apra Harbor recorded an inch of rain in one hour.

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm
PACIFIC									
Guam									
Countywide	14	1100SST 1400SST			0	0			Urban/Sml Stream Fld
An upper level low moving through the region enhanced shower activity across the island of Guam. This brought a period of heavy rain showers and thunderstorms between 1100 and 1400. At the National Weather Service Office in Tiyan 2.43 inches of rain fell between 1000 and 1600.									
PENNSYLVANIA, Central									
Cambria County									
Vinco	06	1350EST			0	0	5K		Thunderstorm Wind
Wires down.									
York County									
Yocumtown	06	1525EST			0	0	5K		Thunderstorm Wind
Trees down.									
Dauphin County									
Harrisburg	06	1545EST			0	0	5K		Thunderstorm Wind
A couple of trees were blown down northeast of Harrisburg.									
York County									
York	06	1900EST			0	0	10K		Flash Flood
07 0300EST Heavy rain from Dennis fell from York County north across Harrisburg to Williamsport. A couple of roads were closed and some low areas flooded.									
Dauphin County									
West End	06	2100EST			0	0	50K		Flash Flood
07 0300EST Heavy rain from Dennis fell across the area, closing roads and flooding basements. In Swatara Township, up to 8 feet of water was reported and one neighborhood was evacuated.									
Perry County									
East Portion	06	2100EST			0	0	20K		Flash Flood
07 0300EST Heavy rain from Dennis flooded roads and basements. Route 11 & 15 was closed north of Liverpool due to mud slides.									
Cumberland County									
East Portion	06	2200EST			0	0	10K		Flash Flood
07 0240EST Streets and underpasses were flooded in Shiremanstown and other eastern areas as heavy rain from Dennis fell across the area.									
Snyder County									
East Portion	06	2300EST			0	0	30K		Flash Flood
07 0600EST Heavy rains from Dennis caused flooding of roads, small streams, and basements in the early morning hours across eastern sections of the county. Areas from Middleburg, east to the Susquehanna River, were hard hit. Campers on the banks of Penns Creek had to be moved to safety. Near Kratzerville, about 30 people were moved to higher ground and campground workers attempted to move some trailers. Several trailers were carried away by the floodwaters. In addition, campers in Kreamer were evacuated when a tributary of Middle Creek flooded. Route 15, the major north/south highway to Harrisburg, was closed due to flooding.									
Union County									
East Portion	07	0001EST			0	0	10M		Flash Flood
0600EST The city of Lewisburg was especially hard hit by the remnants of Hurricane Dennis as up to 8 inches of rain fell in 24 hours, most of it during the early morning hours. Waters rose rapidly in the early morning hours. At least 160 people were displaced from their homes, many of them Bucknell University students. A total of 414 homes were affected by the flooding along with 30 county businesses. Vehicles were floated down the city side streets and 162 were damaged. The campus of Bucknell University also had damage. Other parts of the county from Mifflinburg east to the Susquehanna River had problems. Route 15, the major north/south highway to Harrisburg, was closed due to flooding.									
Northumberland County									
West Portion	07	0130EST			0	0	30K		Flash Flood
0600EST Dennis caused flooding in Watsonstown and Milton in the early morning hours as heavy rains fell across the area.									
Lycoming County									
Southeast Portion	07	0200EST			0	0	1M		Flash Flood
0600EST The remnants of Hurricane Dennis produced 4 to 8 inches of rain across the southeast parts of Lycoming County. Particularly hard hit was Montgomery where flooding was compared to Agnes in 1972. Major flooding hit around 3:00 a.m. EDT. Thirty homes were									

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

PENNSYLVANIA, Central

damaged and one bridge was out of service. Around 80 people were evacuated between 2:00 a.m. and 4:00 a.m., with a large number of residents abandoning their homes at the lower end of West Houston Avenue and Brook Street. Others left homes on Main Street and the campground. One person told of leaving his home, only to find his car had been overturned by the water.

Mckean County Wetmore

09 1655EST **0 0 5K** **Thunderstorm Wind**
Trees down in Wetmore, about 2 miles northwest of Kane, on Route 6.

Mckean County Lafayette

09 1710EST **0 0 5K** **Thunderstorm Wind**
Trees down on Route 219, just west of Lafayette, or about 5 miles south of Lewis Run.

York County Hallam

09 1740EST **0 0 5K** **Flash Flood**
2200EST
Route 462 and Kreutz Creek Road flooded.

Lancaster County Mt Joy

09 1745EST **0 0 5K** **Flash Flood**
2200EST
Cars stalled in high water.

Adams County Countywide

16 1300EST **0 0 20K** **Flash Flood**
2100EST

Cumberland County Countywide

16 1300EST **0 0 15K** **Flash Flood**
2100EST

Dauphin County Countywide

16 1300EST **0 0 30K** **Flash Flood**
2100EST

Lancaster County Countywide

16 1300EST **0 0 1.6M** **Flash Flood**
2100EST

Hurricane Floyd moved inland across North Carolina before sunrise on Thursday, September 16th, accelerated northward over eastern Virginia during the morning, crossed eastern Maryland by Thursday afternoon, and reached Long Island by evening. In its wake, heavy rains fell across North Carolina and Virginia into Pennsylvania. Although not nearly as severe as the destruction across areas to the south and east, the middle and lower Susquehanna region of central Pennsylvania endured 24-hour rainfall totals of 5 to 10 inches that flooded roads, fields, basements, small streams, and the Conestoga River that flows through the city of Lancaster. President Clinton declared Lancaster and York counties major disaster areas, along with other counties to the east.

Hardest hit in the region was Lancaster County. By mid-afternoon Thursday, many roads were closed, school children had been returned home, and water rescues were underway. Most significant flooding began around 2:00 p.m. EDT as rainfall totals in Dauphin, Lancaster, Lebanon, Schuylkill, and York counties approached 4 and 5 inches.

There were no directly related fatalities in the area, although two people died when their van skidded and struck a tree when the vehicle hydroplaned on the Marietta Pike in Lancaster County. Around 2:00 p.m., a 15-year old boy attempted to bring family pets to safety from the backyard when the waters of Muddy Creek rose rapidly, trapping him. The young man was rescued by boat as he clung to a tree trunk in water up to his chest. A volunteer firefighter was also injured during cleanup when tree branches fell on him and he hit his head on a guardrail. A number of people were stranded in their vehicles when they intentionally drove around road closure signs. Some even moved road barriers so they could proceed.

The Conestoga River in the city of Lancaster flooded Thursday evening and crested at 16.39 feet early Friday morning. Major damage occurred on the northeast side of the city, and four neighborhoods were evacuated. The crest was the 4th highest flood of record at the site.

Other areas of the lower and middle Susquehanna region endured flooding of a lesser magnitude with flooding of small streams, roads, and basements. A mobile home park in eastern York County was evacuated as waters approached floor levels of the homes.

Lebanon County Countywide

16 1300EST **0 0 20K** **Flash Flood**
2100EST

Perry County Countywide

16 1300EST **0 0 20K** **Flash Flood**
2100EST

Schuylkill County Countywide

16 1300EST **0 0 20K** **Flash Flood**
2100EST

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

PENNSYLVANIA, Central

York County Countywide

16 1300EST 2100EST 0 0 30K Flash Flood

PAZ041>042-046-049>050-053-057>059-063>066 Northern Lycoming - Sullivan - Southern Lycoming - Union - Snyder - Columbia - Dauphin - Schuylkill - Lebanon - Cumberland - Adams - York - Lancaster

16 1600EST 2200EST 0 0 100K High Wind (G60)

Strong northeast winds from Floyd, combined with waterlogged soils, brought down thousands of trees across parts of the middle and lower Susquehanna region. High Knob in Sullivan County had hundreds of trees downed across the mountaintop, and Ricketts Glen State Park had many trees down. In the Harrisburg area alone, more than 50,000 were without power. Wind caused a Conrail freight train's cars to shift on the Rockville Bridge north of Harrisburg. Several cars actually tipped over, but their contents did not spill into the Susquehanna River. Utility poles were also downed in a number of areas due to the winds and wet soils.

Columbia County Countywide

16 1630EST 1930EST 0 0 20K Flash Flood

Lycoming County Countywide

16 1630EST 1930EST 0 0 20K Flash Flood

Montour County Countywide

16 1630EST 1930EST 0 0 10K Flash Flood

Northumberland County

Countywide 16 1630EST 1930EST 0 0 20K Flash Flood

Snyder County Countywide

16 1630EST 2030EST 0 0 10K Flash Flood

Union County Countywide

16 1630EST 2030EST 0 0 20K Flash Flood

PAZ004-010>012-017>019-024>028-033>037-041>042-045>046-049>053-056>059-063>066 Warren - Elk - Cameron - Northern Clinton - Clearfield - Northern Centre - Southern Centre - Cambria - Blair - Huntingdon - Mifflin - Juniata - Somerset - Bedford - Fulton - Franklin - Tioga - Northern Lycoming - Sullivan - Southern Clinton - Southern Lycoming - Union - Snyder - Montour - Northumberland - Columbia - Perry - Dauphin - Schuylkill - Lebanon - Cumberland - Adams - York - Lancaster

29 2000EST 2300EST 0 0 100K High Wind (G60)

A fast moving cold front raced east across the area taking down trees, blocking roads, and interrupting power in many locations. Much of the damage was related to strong winds with the front, although in several locations thunder was also heard. In Cambria County, a tree was down on a police car in Belsamo. An entire stand of trees were cleared south of Lewistown. A tree was down on a car in Sunbury. A couple in Springettsburg Township near York thought a tornado had crossed their backyard when all of the trees were blown down. Many counties reported damage to trees in many locations, and highway crews were out overnight removing trees and debris in each of the counties.

Blair County Altoona

29 2130EST 10K Thunderstorm Wind
Trees down in altoona and Williamsburg.

Cambria County Colver

29 2130EST 5K Thunderstorm Wind
Trees down.

Clearfield County Morrisdale

29 2130EST 5K Thunderstorm Wind
Route 53 closed due to downed trees.

Centre County Stormstown

29 2145EST 5K Thunderstorm Wind
Winds downed trees on Route 550 near Stormstown.

Clinton County Renovo

29 2230EST 5K Thunderstorm Wind
Trees down.

Clinton County Mill Hall

29 2315EST 2K Thunderstorm Wind
G60 mph and large limbs down.

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time	Path	Path	Number of		Estimated		Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	

PENNSYLVANIA, Central

Juniata County								
Mifflintown	29	2327EST			0	0	2K	Thunderstorm Wind
		Trees down.						
Snyder County								
Middleburg	29	2342EST			0	0	5K	Thunderstorm Wind
		Trees down.						
Cumberland County								
Shiremanstown	29	2350EST			0	0	5K	Thunderstorm Wind
		Gusts to 63 mph. Trees down.						
Northumberland County								
Sunbury	29	2358EST			0	0	10K	Thunderstorm Wind
		Tree on a car.						
Dauphin County								
Harrisburg	30	0001EST			0	0	5K	Thunderstorm Wind
		Trees down in Harrisburg area.						
Montour County								
Danville	30	0005EST			0	0	5K	Thunderstorm Wind
		Trees down.						
Columbia County								
Catawissa	30	0015EST			0	0	5K	Thunderstorm Wind
		Trees were down in Beaver Township about 3 miles southeast of Catawissa.						
Sullivan County								
Laporte	30	0020EST			0	0	2K	Thunderstorm Wind
		Tree down on Route 220 between LaPorte and Dushore.						
Lebanon County								
Cornwall	30	0030EST			0	0	5K	Thunderstorm Wind
		Trees down.						
Schuylkill County								
Hometown	30	0030EST			0	0	10K	Thunderstorm Wind
		Trees down in Ryan and Rush Townships.						
Snyder County								
Countywide	30	0100EST			0	0		Flash Flood
		0400EST						
		2.5 to 3 inches of rain caused poor drainage flooding.						
Union County								
Countywide	30	0100EST			0	0		Flash Flood
		0400EST						
		2.5 to 3 inches caused poor drainage flooding.						

PENNSYLVANIA, East

PAZ054>055-060>062-067>071	Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia							
	01	0000EST			0	0		Drought
	30	0800EST						
	The drought that gripped the Middle Atlantic States throughout much of the growing season eased in mid August. Normal and in some cases heavier than normal rainfall returned. The drought for all intents and purposes ended with the arrival of the torrential rain associated with Hurricane Floyd on the 16th. As much as 12 inches of rain (or nearly 4 months worth of normal rainfall) fell from Floyd across Southeast Pennsylvania with as much as 10 inches elsewhere across Eastern Pennsylvania. The drought emergency was lifted by Governor Tom Ridge on September 30th. Agricultural losses throughout the state of Pennsylvania were estimated at around 700 million dollars, 50 million dollars in Berks County alone.							
Delaware County								
Countywide	05	1600EST			0	0		Heavy Rain
		2100EST						
Berks County								
Countywide	05	1700EST			0	0		Heavy Rain
		2200EST						
Chester County								
Countywide	05	1700EST			0	0		Heavy Rain
		2200EST						
	A nearly stationary band of heavy rain associated with the remnants of Tropical Depression Dennis moved through Berks, Chester and Delaware Counties during the evening of the 5th. The heaviest band covered much of Delaware County, the northeast half of Chester							

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

PENNSYLVANIA, East

County and followed the Schuylkill River through the central third of Berks County. Storm totals averaged between 1 and 2 inches, but up to three inches fell in Berks County. Some poor drainage flooding occurred, but no other damage was reported. The Valley Creek at Valley Forge crested at 6.8 feet, just below its flood stage of 7.0 feet. With Tropical Depression Dennis still along the Virginia/North Carolina border at the time of the heavy rain, this band left the area vulnerable to additional heavy rain. Storm totals included 2.90 inches in Hamburg (Berks County), 2.02 inches in Exton (Chester County), 1.94 inches in Reading (Berks County), 1.90 inches in Glenmoore (Chester County), 1.42 inches in West Chester (Chester County) and 1.20 inches in Crum Creek (Delaware County).

Berks County North Portion

**07 0330EST
0530EST 0 0 Flood**

Heavy rains associated with the remnants of Tropical Depression Dennis produced heavy rain and flooding across the northern half of Berks County during the early morning of the 7th. The worst flooding was reported along the Sacony Creek in Virgenville. This was the second band of very heavy rain to affect the county within 48 hours. Storm totals included 3.20 inches in Virgenville, 2.05 inches in Bernville, 1.80 inches in Gibraltar and 1.55 inches in Reading. No serious injuries were reported.

Berks County Centerport

09 1550EST 0 0 Hail (0.75)

Berks County Berne

09 1600EST 0 0 0 Lightning

Berks County Lenhartsville

09 1615EST 0 0 Hail (0.88)

Berks County Wyomissing

09 1625EST 0 0 Thunderstorm Wind (G50)

A pair of severe thunderstorms produced large hail, damaging wind gusts and frequent lightning across Berks County. Large hail occurred in Centerport and Lenhartsville. Tree damage was reported in Wyomissing Borough. Lightning blew apart a chimney in Bern Township. Pieces of the chimney damaged the house's roof.

Berks County Rehlersburg

09 1740EST 0 0 0 Lightning

Lightning struck and damaged a tree and garage in Tulpehocken Township.

Monroe County Snydersville

09 1800EST 0 0 0 Thunderstorm Wind (G57)

A severe thunderstorm produced damaging winds and frequent lightning across southern Monroe County. Several trees and wires were knocked down.

Monroe County Southeast Portion

**09 1830EST
2100EST 0 0 Flood**

Berks County Central Portion

**09 1900EST
2100EST 0 0 Flood**

Northampton County Countywide

**09 1900EST
2100EST 0 0 Flood**

Thunderstorms with torrential downpours produced considerable poor drainage flooding and stream flooding in Berks, Monroe and Northampton Counties. Hardest hit was Northampton County. Streams that overflowed their banks produced some localized flooding. Poor drainage flooding occurred around Nazareth. Similar occurrences occurred around Stroudsburg in Monroe County and Reading in Berks County. Within Reading a pick-up truck and a sports utility vehicle became submerged in the Spring Street underpass. No serious injuries were reported. Storm totals included 2.75 inches in East Stroudsburg (Monroe County), 2.67 inches in Nazareth (Northampton County), 2.33 inches in Bath (Northampton County), 1.52 inches at the Lehigh Valley International Airport and 1.40 inches in Easton (Northampton County).

Bucks County Doylestown

**09 2000EST
2200EST 0 0 Heavy Rain**

Chester County Valley Forge

**09 2000EST
2200EST 0 0 Heavy Rain**

Montgomery County King Of Prussia to Willow Grove

**09 2000EST
2200EST 0 0 Heavy Rain**

Philadelphia County Countywide

**09 2100EST
2300EST 0 0 Heavy Rain**

Thunderstorms with heavy rain produced poor drainage and minor street flooding across Philadelphia and the nearby suburbs during the late evening of September 9th. Rainfall rates were as heavy as 2 inches per hour, but the thunderstorms moved fast enough to prevent creeks and streams from flooding. Heavy rain fell throughout the city of Philadelphia, but affected mainly eastern Chester

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm
<u>PENNSYLVANIA, East</u>									
	County, Lower Montgomery County and central Bucks County in the surrounding suburbs. Storm totals included 2.48 inches in Doylestown (Bucks County), 2.18 inches in King of Prussia (Montgomery County), 1.77 inches at the Philadelphia International Airport, 1.73 inches in Valley Forge (Chester County) and 1.70 inches at the Willow Grove NAS.								
Berks County									
Countywide	16	0900EST			0	0	1M		Flash Flood
	17	0900EST							
Bucks County									
Countywide	16	0900EST			0	15	22M		Flash Flood
	17	0500EST							
Delaware County									
Countywide	16	0900EST			1	14	15M		Flash Flood
	17	1400EST							
	M67VE								
Philadelphia County									
Countywide	16	0900EST			1	0	4.2M		Flash Flood
	17	1300EST							
	M48VE								
Chester County									
Countywide	16	1000EST			1	1	3M		Flash Flood
	17	1400EST							
	F53PH								
Montgomery County									
Countywide	16	1000EST			3	8	12M		Flash Flood
	17	1600EST							
	M49VE, F73VE, M47VE								
Lehigh County									
Countywide	16	1100EST			0	0			Flash Flood
		2300EST							
Northampton County									
Countywide	16	1200EST			0	0			Flash Flood
		2300EST							
Carbon County									
Countywide	16	1300EST			0	0			Flash Flood
		2300EST							
Monroe County									
Countywide	16	1300EST			0	0			Flash Flood
		2300EST							
PAZ069>071		Bucks - Delaware - Philadelphia							
	16	1400EST			0	0			Tidal Flooding
		2130EST							
PAZ054>055-060>062-067>071	Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia								
	16	1500EST			0	0	2.8M		High Wind (G50)
		2300EST							

Hurricane Floyd battered Eastern Pennsylvania (especially Southeast sections around Philadelphia) on September 16th and brought with it torrential and in some places record breaking rains and damaging winds. The hurricane caused widespread flash flooding as storm totals averaged around six inches in the Poconos and Berks County, eight inches in the Lehigh Valley and from eight to twelve inches in the Greater Philadelphia Metropolitan Area. Six people died directly from the hurricane - four drownings and two persons were hit by trees. The hurricane also indirectly contributed to the death of about seven other persons. About 40 persons were seriously injured. There were hundreds of rescues from creeks and trapped/submerged vehicles. Many people ignored barricades and became stranded in flood waters. About 7,000 persons were evacuated, more than half were from Delaware and Bucks Counties, the two hardest hit counties in the state. The Preliminary damage estimate was 60 million dollars. Damage to infrastructure was around 20 million dollars and hundreds of roads and dozens of bridges were damaged or closed. A couple of bridges in Bucks County are not expected to be reopened until 2001. About 200 houses were seriously damaged or destroyed, another 1,000 were damaged but still inhabitable. Over 10,000 homes were flooded. Over 500 apartments were also damaged as were over 100 businesses. The flooding affected fourteen key regional rail service lines around Philadelphia, many were closed and/or damaged. About 501,000 homes and businesses lost power - 412,000 in the PECO Service area in Southeast Pennsylvania, the second worst outage in the company's history. School children were dismissed early. Sewage treatment plants were so overwhelmed with runoff that many spewed raw sewage into the streams and rivers.

The first directly related hurricane death occurred in East Nottingham Township in Chester County. A 53-year-old woman was crushed when a tree fell through her house. In Montgomery County three persons drowned in their vehicles when they attempted to drive across flooded roadways. One drove around barricades. A 49-year-old male was found inside his vehicle in the Perkiomen

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	Character of Storm	
Location	Date								

PENNSYLVANIA, East

around barricades. A 49-year-old male was found inside his vehicle in the Perkiomen Creek in Perkiomen Valley Park. His disabled vehicle apparently was swept into the creek. A 73-year-old woman was found inside her vehicle in the Wissahickon Creek in Whitemarsh Township. Her vehicle was swept off the road and became pinned against a tree along the banks of the creek. A 47-year-old man in West Conshohocken drowned after he drove around barricades and became stuck in flood waters. His father who was a passenger in the car escaped. In Delaware County, a 67-year-old man drowned in Darby Borough while delivering pizzas. His van was caught in the swirling waters of the Darby Creek. In Philadelphia, a 48-year-old man was crushed by a fallen tree as he was waiting for a green light in Fairmount Park. The torrential rain associated with Floyd contributed to the death of a family (3 persons) on the Pennsylvania Turnpike in Chester County and a 44 year-old man in Upper Pottsgrove Township in Montgomery County. Two other men in Montgomery County (a 61-year-old and a 51-year-old) suffered heart attacks and died while trying to remove water from his basement and while being evacuated. A third (67-year-old) man died of a heart attack in Chester County (West Whiteland Township) while trying to push his vehicle from flood waters on Pennsylvania State Route 100.

The highest verifiable storm total was 12.13 inches in Marcus Hook (Delaware County). Philadelphia International Airport not only set a new daily precipitation record of 6.63 inches, but also a new 24 hour record of 6.77 inches. Based on SKYWARN Spotter reports and Doppler Radar precipitation estimates, the area of heaviest precipitation coincided near the "fall line" in Southeast Pennsylvania. The fall line is the boundary between the coastal plain and the Piedmont and represents the first significant rise of the land from near sea level. The onshore flow being lifted over this geographic feature dumped the heaviest rain around this area and fell across northern Delaware and Philadelphia Counties and Lower Montgomery and Bucks Counties. The torrential downpours associated with Hurricane Floyd exceeded the 100-year-flood return period in locations in and around the "fall line" and several rivers and streams either set record or had their second highest crests on record. The combination of winds funneling up Delaware Bay and the river and the record runoff from inland waterways produced moderate tidal flooding at the times of high tide in Delaware, Philadelphia and Bucks Counties. Evacuations occurred in low-lying areas near the river. The evening (16th) high tide also slowed the discharge of streams into the Delaware. The highest wind gusts in most areas were less than 60 mph. But, the combination of the heavy rain that loosened the ground and the persistence of the strong winds uprooted hundreds of trees. Governor Tom Ridge declared a disaster emergency on the 16th. President Clinton declared Bucks, Chester, Delaware, Montgomery and Philadelphia Counties a disaster area. Homeowners in Berks County were also eligible for damage assistance.

Hurricane Floyd began as a Cape Verde type hurricane east of the Lesser Antilles. As Floyd moved westward, it passed to the north of and spared both the Greater and Lesser Antilles. Floyd intensified into a Category (Major) IV Hurricane on the Saffir-Simpson Scale. Floyd was also a very large in size hurricane that would prolong the extent of both the torrential rain and high winds. Floyd was heading for Florida before a turn to the northwest spared the state, but Floyd battered the Bahamas. The anticipated turn to the north and the northeast occurred on the 15th as Floyd was heading for North Carolina. Another important synoptic feature was a cold front that was over West Virginia on the 14th. This front stalled in Eastern Pennsylvania on the 15th. The stalled front not only failed to push offshore an already tropical and humid air mass that was over the state, but also acted as a conduit for the tropical moisture associated with Floyd. The moisture headed west toward the front, rising upward along the fall line and dropped the heaviest rain near this geographic feature. Light rain associated with Floyd started in the state on the 15th. The torrential rain associated with Floyd arrived around 5 a.m. EDT in the southern part of the state and spread into the Poconos by 10 a.m. EDT. Floyd was just making landfall at the Mouth of Cape Fear or Bald Head Island in North Carolina as the heavy rain crossed the Mason/Dixon Line. Floyd started to accelerate northeast during the morning of the 16th. Some gusty winds arrived in the state during the morning of the 16th. A weakened (with respect to wind) Category One Floyd moved through Virginia Beach, Virginia and was back over the open Atlantic Ocean around noon on the 16th. Floyd continued to move northeast and the eye passed just east of the Virginia Capes and Fenwick Island, Delaware around 3 p.m. EDT. By the afternoon of the 16th all the torrential rain had moved north of Floyd and ended with the passage of the hurricane (on the same latitude line). During the afternoon of the 16th all of the sustained hurricane force winds were located over the Atlantic. At 5 p.m. EDT Floyd was downgraded to a tropical storm as it passed about 10 miles east of Atlantic City. Between 6 p.m. and 8 p.m. EDT the torrential rain ended across the state. But the strongest winds associated with Floyd mixed down as cooler air behind the system moved into the region. For many locations the strongest wind gusts occurred between 4 p.m. and 10 p.m. EDT and the highest gusts occurred over higher terrain locations. Wind gusts rarely exceeded 50 mph, but all the flooding rains made it easier for trees to be knocked over. Tropical Storm Floyd made landfall again on western Fire Island in Suffolk County, New York around 8 p.m. EDT and was located near Portland, Maine at 8 a.m. EDT on the 17th.

Floyd hit Bucks County the hardest, especially in the Neshaminy Creek Basin. The Neshaminy Creek had its second highest crest on record only surpassed by Hurricanes Connie and Diane in 1955. About 2,000 people were evacuated and numerous rescues occurred. In Buckingham Township, 11 school children and the bus driver were rescued after being stranded in the Mill Creek. Twenty-nine homes were destroyed, 80 other were damaged or uninhabitable and 304 others were damaged but still inhabitable. Thirty-two businesses were damaged or destroyed, twelve public buildings or pieces of equipment were destroyed and eighteen public parks were damaged. Flooding was extensive along the Neshaminy Basin from Warrington Township to Bristol Township. In Middletown Township homes along Bridle Drive and Periwinkle Avenue were severely flooded. One house was swept 10 feet off its foundation. Several underground heating oil tanks erupted. In Northampton Township, every bridge over the Neshaminy Creek was closed. Many cars became stranded after driving around barricades. Persons were rescued from car tops. The Langhorne Players Building was destroyed. In Warrington Township five homes along the Little Neshaminy Creek were deemed uninhabitable. The second hard hit area was in townships along the Delaware River as the evening high tide slowed the discharge of streams into the river. Evacuations occurred along the Delaware River in Yardley and Lower Makefield Township, two people were rescued from 10 feet of water. Elsewhere in the county, flooding along the East Branch of the Perkiomen Creek forced the evacuation of downtown Sellersville. In Upper Southampton Township, two homes collapsed because of the heavy rain. Nearly every creek and even some

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

PENNSYLVANIA, East

Southampton Township, two homes collapsed because of the heavy rain. Nearly every creek and even some lakes (Silver Lake in Bristol Borough) overflowed. High winds also took their toll. A Perkasio woman was injured trying to remove a downed tree. A fallen tree severely damaged a house in Falls Township. The SEPTA Regional rail service to Trenton was stopped because of downed trees on the tracks. Seventy roads were closed and included long stretches of Pennsylvania State Route 611. Seven roads were too damaged to be reopened in Buckingham, Lower Makefield and Upper Makefield Townships. They were still closed on the 25th. Pennsylvania State Route 32 in Solebury Township was expected to be closed indefinitely. Bridges were damaged or washed out in Buckingham, Durham, Solebury, Upper Makefield and Wrightstown Townships. Three bridges were destroyed and were not expected to be reopened until 2001. They are River Road (Pennsylvania State Route 32) over the Jericho Creek in Upper Makefield Township, New Hope Road over the Mill Creek in Buckingham Townships and Swamp Road over the Mill Creek in Wrightstown Township.

Delaware County was the second hardest hit county in the state, but no location was hit harder than Darby Borough as flooding along the Darby and Cobb Creeks cut off and decimated the borough. Seven hundred people were evacuated, one hundred were rescued by boat, 11 were plucked from flood waters. The creek devoured residents and businesses along Mill and Walnut Streets. Twenty-five businesses were in ruin; a bank and liquor store disappeared under eight feet of flood water. A delivery van floated into six 2,000 gallon tanks containing toxic solvents, four were recovered. An ice machine was recovered half a mile downstream. The Colwyn section of Lansdowne Borough was also hard hit by the Darby Creek flooding. During the evening of the 16th about 1,000 persons were evacuated in the Crum Creek Valley in Marple, Media, Nether Providence, Ridley, Swarthmore, and Upper Providence Townships. Officials feared the record rainfall would damage the Springton Reservoir Dam's spillway. Other evacuations occurred along the Chester Creek in Aston, Brookhaven, Chester City and Upland Borough. The Chester Creek in Chester had its second highest crest on record since 1971. Tidal flooding also forced the evacuation of about 500 people along the Delaware River in Marcus Hook. Flooding forced evacuations along the Marcus Hook in Upper Chichester Township and Trainer Borough. Intense flooding along Pennsylvania State Route 291 forced the evacuation of 200 people in Tinicum Township. Numerous roads were closed and several were damaged. Two were still closed on the 21st. Numerous water rescues occurred. A Lansdowne firefighter was injured while trying to rescue several children stuck in a tree. A 58-year-old woman was injured when she inadvertently lit an M80 instead of a candle. Mud reached three to four feet high in the business district of Aston Township. The high winds downed numerous trees across the county. One tree damaged a home in Media Borough. Delaware and Chester Counties bore the brunt of the power outages in PECO Energy's service area.

In Montgomery County, about 1,500 persons were evacuated. Evacuations occurred in low-lying areas of Abington, Collegeville, Conshohocken, Lower Moreland, Upper Dublin, Upper Moreland and West Norriton Townships. In Upper Dublin Township, 100 residents and 65 children were evacuated after water overflowed the top of the Loch Alsh Reservoir. Numerous water rescues occurred, some from car tops. In Conshohocken, a regional rail car became surrounded by 6 feet of flood waters from the Plymouth Creek quickly. Ten people were trapped. A rescue boat sent capsized and several passengers clung to a tree for a couple of hours before finally being rescued. About 75 persons were rescued from flood waters in Upper Dublin and Springfield Townships, many in the Fort Washington Interchange of the Pennsylvania Turnpike. In Upper Milford Township, a man was rescued after being sucked into an over flow pipe. In Lower Providence Township, a 13-year-old girl was rescued after falling into Mine Run Creek. Ninety-two homes were deemed uninhabitable and 538 others were damaged, but uninhabitable. Ninety-one businesses and 461 apartments were damaged. Hardest hit in the county was Lower Moreland Township. About 100 apartment units in the Huntingdon Valley Condominiums were flooded and contaminated by raw sewage, heating oil and gasoline. All first floor units lost their possessions. The second hardest hit area was along the Schuylkill River from Upper Providence Township south to Conshohocken. In Upper Providence Township, flooding reached the first floor in Port Providence. Numerous trees were knocked down throughout the county and damaged several vehicles.

In Chester County, severe and record breaking flooding was reported along the branches and main stem of the Brandywine Creek. In Modena along the West Branch of the Brandywine Creek, twenty households were evacuated, the first evacuations 31 years. Along the East Branch of the Brandywine Creek, a small residential community was leveled in East Bradford Township with losses reaching 90 percent. The flood stage was about 1 foot higher than occurred with Hurricane Agnes in 1972. Gibson's Covered Bridge was severely damaged as trees smashed into its roof. Farther upstream in Downingtown, twenty homes were severely damaged as fuel oil leaked from their tanks in flooded basements. Fifty other homes were severely damaged and hundreds others had minimal damage. In Phoenixville, thirty people were rescued or evacuated near the Schuylkill River. Severe flooding closed sections of Pennsylvania State Route 100 and United States Routes 1 and 30, especially near the Valley and Brandywine Creeks. Chester County was hit the hardest in the Philadelphia area with respect to wind damage. Houses were damaged by fallen trees in Kenneth Square, Oxford and West Bradford Townships. A PECO linesman was injured after a tree fell on his ladder. Both the East Branch of the Brandywine Creek at Downingtown and the main stem Brandywine Creek at Chadds Ford (Delaware/Chester county line) had record crests, the previous record occurred during Hurricane Agnes in June of 1972. Chester and Delaware Counties bore the brunt of the 412,000 outages in PECO Energy's service area.

In Philadelphia, the worst flooding occurred along Cobbs Creek along the Philadelphia/Delaware County border. About 1,000 people were evacuated and 3,500 homes were flooded. Jet skis were used to rescue people. In Manayunk, flooding along the Schuylkill River covered Main Street. Many basements were flooded and one worker was rescued from a flooded basement. Four hundred people were stranded at the Radisson Hotel near the Philadelphia International Airport. Some foundations were undermined in the city's Roxborough section. Numerous trees were knocked down, several damaged vehicles around the University of Pennsylvania. Tidal flooding along the Delaware River also caused some moderate flooding in low lying areas on the river around 7 p.m. EDT.

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	Character of Storm	

PENNSYLVANIA, East

Il River flooded. Many basements were flooded and numerous roads were closed into the morning of the 17th due to either standing water and/or debris. About 15 people were evacuated along the Allegheny (Robeson Township) and Sacony (Kutztown Borough) Creeks. Flooding along the Stony Creek forced the evacuation of a high school at 11 a.m. EDT. Flooding was also reported along the Hay and Monocacy Creeks. Water rescues were performed in Exeter and Longswamp Townships. About 31,500 homes and businesses lost power in the county due to downed trees and wires. Power was totally restored on the 20th. In the Lehigh Valley and the Poconos the winds of Floyd were as much of a problem as were the heavy rains. Numerous trees were knocked down. In Northampton County, there were over 100 calls for removal of downed trees. Downed trees closed U.S. Route 209 in Carbon County. GPU Energy reported 16,325 homes and businesses lost power in the Lehigh Valley and all power was restored on the 17th. PPL reported 41,000 homes and businesses lost power in their Eastern Pennsylvania service area. The heavy rain pushed numerous streams over bankfull. The Bushkill (Northampton County), Cedar (Lehigh County), Jordan (Lehigh County), Little Lehigh (Lehigh County), Monocacy (Lehigh County), Saucon (Lehigh County) and Trout (Monroe and Lehigh County) Creeks all flooded. Flooding and road closures were reported along U.S. Route 22 and Pennsylvania State Routes 309,313,512 and 611. Numerous basements were flooded and several smaller roads were washed out. A mudslide closed Pennsylvania State Route 611 in the Delaware Water Gap National Recreational Area. The city of Allentown stopped drawing water from the Little Lehigh Creek because it was becoming contaminated with dirt and other substances. People were rescued from trapped cars in both Lower Macungie (Lehigh County) and Lower Saucon (Northampton County) Townships.

Along the Schuylkill River in Berne (Berks County) it crested at 13.3 feet at Midnight EDT on the 17th. Flood stage is 12 feet. In Reading, it crested at 14.9 feet at 6 a.m. EDT on the 17th. Flood stage is 13 feet. In Montgomery County, in Pottstown, the Schuylkill crested at 14.4 feet at 4 a.m. EDT on the 17th. Flood stage is 13 feet. In Norristown, it crested at 22.1 feet at 3 a.m. EDT on the 17th, flood stage is 17 feet. In Philadelphia it crested at 14.1 feet at 4 a.m. EDT on the 17th. Flood stage is 11 feet. In Bucks County, the Neshaminy Creek at Langhorne crested at 21.9 feet, the second highest crest in history (Record set with Connie/Diane August 1955.). Flood stage is 9 feet. In Montgomery County, the Perkiomen Creek at Graterford crested at 16.6 feet at 9 p.m. EDT on the 16th. Flood stage is 11 feet. The East Branch of the Perkiomen Creek near Schwenksville crested at a RECORD BREAKING 14.2 feet. Flood stage is estimated at 7 feet. In Chester County, the West Branch of the Brandywine Creek in Coatesville crested at 8 feet at 9 p.m. EDT on the 16th. Flood stage is estimated at 7 feet. Farther downstream in Modena, it crested at 9.8 feet at 6 p.m. EDT on the 16th. Flood stage is 9 feet. In Downingtown, the East Branch of the Brandywine Creek crested at a RECORD BREAKING 14.7 feet at 8 p.m. EDT on the 16th. Flood stage is 7 feet. In Chadds Ford, the Brandywine Creek crested at a RECORD BREAKING 17.2 feet at 1 a.m. EDT on the 17th. Flood stage is 9 feet. Both Brandywine Creek previous records occurred during Hurricane Agnes in June of 1972. The Valley Creek in Valley Forge crested at a RECORD BREAKING 14.5 at 5 p.m. EDT on the 16th. Flood stage is estimated at 7 feet. In Delaware County, The Chester Creek in Chester crested at 19.6 feet at 6 p.m. EDT on the 16th, second highest crest on record. Flood stage is 8 feet. In Philadelphia, the Wissahickon Creek near its mouth crested at a RECORD BREAKING 10.7 feet at 945 p.m. EDT on the 16th. Several smaller streams in Southeast Pennsylvania also had RECORD BREAKING crests. They included the Tohickon Creek near Pipersville (Bucks County) at 11.8 feet, the North Branch of the Neshaminy Creek at both New Britain (Bucks County) at 4.9 feet and Chalfont (Bucks County) at 11.4 feet, the East Branch of the Perkiomen Creek near Dublin (Bucks County) at 8.6 feet, Crum Creek near Newtown Square (Delaware County) at 11.9 feet, Ridley Creek at Media (Delaware County) at 15.0 feet and the Red Clay Creek near Kennett Square (Chester County) at 10.0 feet. Along the Delaware River itself in Philadelphia (near Washington Street), high tide crested at 9.4 feet above mean lower low water at 640 p.m. EDT on the 16th. Moderate tidal flooding along the river starts at 9.2 feet above mean lower low water.

Precipitation storm totals (done from north to south with up to the four highest reported amounts per county) included: In Carbon County 7.24 inches at the County Tower, 6.95 inches in Lehigh, 6.55 inches in Beltsville and 6.12 at the F.E. Walter Dam. In Monroe County 8.01 inches in Bossardsville, 7.24 inches in Tobyhanna, 7.12 inches in East Stroudsburg and 6.50 inches in Pocono Summit. In Northampton County 9.99 inches in Bethlehem, 6.20 inches in Walnutport and 6.02 inches in Bath. In Lehigh County 7.62 inches in Allentown, 7.61 inches at the Lehigh Valley International Airport and 7.51 inches in Claussville. In Berks County 7.18 inches in Bechtelsville, 6.90 inches in Reading, 6.28 inches in Blue Marsh and 6.10 inches in Hamburg. In Bucks County 10.07 inches in Doylestown, 9.07 inches in New Hope, 8.85 inches in Furlong and 8.08 inches in Sellersville. In Montgomery County 11.26 inches in Norristown, 10.83 inches in Horsham, 9.65 inches in Bala-Cynwyd and 9.40 inches in West Conshohocken. In Chester County 10.31 inches in Phoenixville, 10.04 inches in Valley Forge and Chester Springs, 8.82 inches in Exton and 8.31 inches in Coatesville. In Delaware County, 12.13 inches in Marcus Hook, 10.64 inches in Newtown Square, 9.56 inches in Ridley Park and 8.25 inches in Chadds Ford. In Philadelphia, 8.12 inches at the Franklin Institute, 8.09 inches at Temple University, 7.11 inches at Fairmount Park and 6.77 inches at the Philadelphia International Airport. Peak wind gusts included 58 mph the Commodore Barry Bridge (Delaware County), 55 mph in Meckesville (Carbon County), 48 mph at the Philadelphia International Airport, 44 mph at the Reading Regional Airport and 43 mph at the Lehigh Valley International Airport. Another unwanted side effect from Floyd was extra mosquitoes.

PAZ054>055-060>062- Carbon - Monroe - Berks - Lehigh - Northampton - Chester - Montgomery - Bucks - Delaware - Philadelphia
067>071

30 2359EST 0 0 Unseasonably Wet

Courtesy of Hurricane Floyd, September 1999 went down as one of the wettest Septembers on record in Pennsylvania. The statewide average monthly rainfall 6.20 inches was the fifth wettest September on record since 1895. Monthly rainfall amounts due to the closer proximity to Floyd were higher in Eastern Pennsylvania and were all in double digits. On a county weighted average September monthly rainfall totals ranged from 10.6 inches in Lehigh County to 13.3 inches in Chester County. New all-time monthly precipitation records were set at both the Lehigh Valley (11.57 inches) and Philadelphia (13.07 inches) International Airports. The

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

PENNSYLVANIA, East

13.07 inches of rain also established a new all-time monthly precipitation record for Philadelphia.

PENNSYLVANIA, Northeast

PAZ038>040-043>044-047>048 **Bradford - Susquehanna - Wayne - Wyoming - Lackawanna - Luzerne - Pike**

01 0000EST 0 0 20M Drought
30 2359EST

A very dry spring and summer caused major crop failures and some wells to run dry. Many streams and rivers were also brought to their lowest recorded levels. The crops most affected were corn and hay, which dealt a major blow to dairy farmers. September rains from the remnants of Hurricanes Dennis and Floyd helped to ease the summertime drought conditions although they came too late to help the vegetable and grain crops.

PAZ040-044-047>048 **Wayne - Lackawanna - Luzerne - Pike**

16 1600EST 0 0 2.5M High Wind
17 0200EST

Strong and damaging winds plagued northeastern Pennsylvania during the late afternoon and night as the remnants of Hurricane Floyd moved up the eastern seaboard. The strong winds began during the afternoon as the tropical system reached the New Jersey coast. Blustery conditions lasted into early the next morning with persistent wind gusts estimated between 40 and 50 mph. Occasionally, wind speeds reached 60 mph or more, especially in the Pocono mountains.

The gale force winds caused considerable tree and powerline damage throughout the Poconos and Wyoming valley. The Pennsylvania Power and Light (PP&L) company reported nearly 260,000 of their customers were without power at some point during the storm. Many did not have electric service restored until late in the day on September 17th. A PP&L company spokesman claimed that this was "the most damage the company had experienced in the last 20 years". Dozens of large trees and limbs were uprooted or knocked down onto buildings and cars throughout northeast Pennsylvania, but the hardest hit area was Luzerne county, especially on the ridges surrounding Wilkes-Barre. The Back Mountain and Bear Creek areas suffered considerable structural damage from trees toppling onto roofs, garages, porches and vehicles. PP&L estimated approximately 1000 powerlines were downed in this county alone. Foresters discovered several thousand uprooted and broken trees at Ricketts Glen State Park.

Lackawanna County
Countywide

16 1800EST 0 0 Flood
17 0300EST

Luzerne County
Countywide

16 1800EST 0 0 Flood
17 0300EST

Pike County
Countywide

16 1800EST 0 0 Flood
17 0300EST

Wayne County
Countywide

16 1800EST 0 0 Flood
17 0300EST

Moisture associated with the remnants of Hurricane Floyd moved north along a frontal boundary that was stalled from eastern Pennsylvania to New England. Rain developed over northeast Pennsylvania during the predawn hours and became heavy at times throughout the afternoon and night as "Floyd" continued up the east coast. Before the rain let up during the morning of the 17th, four to seven inches of rain was common across the Poconos and Wyoming Valley. Slightly lesser amounts, ranging from three to five inches were noted in the northern Tier.

Fortunately, due to the drought conditions that plagued the area over the summer months, these heavy amounts of rain were able to be efficiently absorbed by the parched topsoil, resulting in widespread, but only minor flooding. Most of northeast Pennsylvania experienced small stream flooding along with ponding and flooding of poor drainage areas and basements. Hardest hit areas were in and around the cities of Wilkes-Barre, Scranton and Hazleton where some flooded streets approached water depths of three feet. Water was seen rushing down hillsides in Pike county where numerous road washouts were reported. Main stem rivers and tributaries experienced no flooding, but water levels and flows increased back to near normal readings after several months below average.

PENNSYLVANIA, Northwest

PAZ001>003 **Northern Erie - Southern Erie - Crawford**

01 0000EST 0 0 Drought
30 2359EST

Drought conditions persisted during the month of September. Heavy rains fell toward the end of the month but that did little to help crop conditions. Actual monetary losses from reduced crop yields will not be known until after the fall harvest.

Erie County
Countywide

29 1615EST 0 0 70K Thunderstorm Wind
1645EST

Thunderstorm winds estimated at 65 to 75 mph downed trees and large limbs throughout the county. At least 20 trees were downed in Corry. A house in Corry was slightly damaged by a tree and two cars were crushed by fallen trees.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

PENNSYLVANIA, Northwest

Crawford County Meadville

29 1700EST
1800EST 0 0 10K Flood

Thunderstorms dumped up to two inches of rain in less than an hour. Flooding was reported on many streets in Meadville with water up to two feet deep in some locations. Several cars were briefly stranded by the high water.

Erie County Erie

29 1700EST
1730EST 0 0 20K Flood

Up to three inches of rain fell early in the evening causing flooding on roadways and in low lying areas. Two cars were trapped in four feet of water underneath a railroad viaduct near the intersection of East 15th Street and Paradise Street on Erie's east side. Two people inside one of the vehicles had to be rescued by firefighters. Officially, 2.99 inches of rain fell at Erie International Airport on the 29th.

Crawford County Countywide

29 1730EST 0 0 50K Thunderstorm Wind

Thunderstorm winds estimated at 65 to 75 mph downed trees throughout the county. A house in Corry was slightly damaged by a fallen tree and cars in Corry and Titusville were destroyed by trees.

PENNSYLVANIA, West

PAZ007>009-013>016- 020>023-029>032

Mercer - Venango - Forest - Lawrence - Butler - Clarion - Jefferson - Beaver - Allegheny - Armstrong - Indiana - Washington - Westmoreland - Greene - Fayette

01 0000EST 0 0 Drought
30 2359EST

Although rainfall across Western Pennsylvania for September again averaged between 1.5 to 2.0 inches below normal, the state-imposed drought emergency for the area, in effect since July 20, was downgraded to a drought warning on September 30. However, the Palmer Drought Severity Index shows the entire Western Pennsylvania area continuing under a moderate to severe drought. Statewide, latest estimates show farmers have lost at least \$700 million from the drought, with up to 50% of the year's crops destroyed.

Venango County Rocky Grove

09 1505EST 0 0 1K Thunderstorm Wind

Thunderstorm winds downed a large tree.

Forest County 3 NE Tionesta

09 1550EST 0 0 10K Thunderstorm Wind

Thunderstorm winds downed several trees along Dawson Run Road. One tree fell onto a garage.

Washington County Canonsburg

29 1445EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several trees and power lines.

Allegheny County Pittsburgh

29 1504EST 0 0 Thunderstorm Wind (G54)

WPXI-TV in Pittsburgh recorded a 62 MPH wind gust.

Beaver County Ambridge

29 1520EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several trees and power lines.

Beaver County 4 N Frankfort Spgs

29 1530EST 0 0 1K Thunderstorm Wind

Thunderstorm winds downed a large tree onto Hanover-Kendal Road.

Butler County 5 S Zelienople

29 1540EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several large trees.

Lawrence County Ellwood City

29 1540EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several large trees and power lines.

Butler County Middle Lancaster

29 1545EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several large trees.

Mercer County Mercer

29 1620EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several trees and power lines.

Venango County Cranberry

29 1620EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several large trees and power lines.

Venango County Emlenton Station

29 1620EST 0 0 3K Thunderstorm Wind

Thunderstorm winds downed several trees and power lines.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property Crops	Character of Storm
<u>PENNSYLVANIA, West</u>								
Armstrong County Kiskimere	29	1715EST			0	0	5K	Thunderstorm Wind
Thunderstorm winds downed trees and power lines in Kiskimere, as well as the Gilpin and Parks Township areas.								
<u>PUERTO RICO</u>								
Ponce Ponce	01	1400AST 1600AST			0	0		Urban/Sml Stream Fld
Heavy rains caused a small stream to overflow its banks flooding various streets in La Playa sector.								
Mayaguez Cabo Rojo	06	1455AST 1457AST	0.2	5	0	0		Tornado (F0)
Civil Defense indicated that they received calls of a tornado in northern Cabo Rojo for a brief period of time. No damage was reported.								
San Juan Orocovis	06	1600AST 1730AST			0	0		Urban/Sml Stream Fld
Heavy rains caused the Rio Orocovis and a small stream in Orocovis to overflow their banks.								
Mayaguez Hormigueros	06	1700AST 1830AST			0	0		Urban/Sml Stream Fld
Two roads flooded in Hormigueros due to heavy rains.								
PRZ013 Arecibo	06	2200AST 2300AST			0	0		Flood
Rio Grande de Manati overflowed its banks at road 2 in Manati.								
Ponce Ponce	07	1700AST 1800AST			0	0		Urban/Sml Stream Fld
NWS employee reported street flooding due to heavy rains.								
Humacao Ceiba	08	1630AST 1631AST	0.1	1	0	0		Tornado (F0)
A Roosevelt Roads Navy Base personnel reported a waterspout that made a brief landfall and dissipated shortly near the airport base.								
Aguadilla San Sebastian	08	1725AST 1925AST			0	0	20K	Flash Flood
Heavy rains caused flash flooding and landslides over parts of San Sebastian. Rio Culebrinas went out of its banks flooding a total of 19 houses over Pepino, Pueblo Nuevo and Union Street sectors. In addition fallen trees and two house with their roofs detached were reported due to strong winds.								
San Juan Barranquitas	09	1445AST 1545AST			0	0		Urban/Sml Stream Fld
Several creeks went out of their banks due to heavy rains.								
Humacao Ceiba	09	1540AST 1545AST			0	0		Waterspout
An employee from Roosevelt Roads Navy Base sighted a waterspout 8 miles southwest of the base in Ceiba.								
Ponce Yauco	13	1605AST 1705AST			0	0		Urban/Sml Stream Fld
Civil Defense indicated very heavy rain and strong gusty winds. A house flooded in Barina sector when a creek overflowed its banks.								
Ponce Yauco	17	1530AST 1630AST			0	0		Urban/Sml Stream Fld
Two streams went out of their banks near El Cafetal and La Perla sectors.								
Mayaguez San German	17	1605AST 1705AST			0	0		Urban/Sml Stream Fld
A skywarn spotter encountered flooding on highway 114. He estimated about 2 feet of water on the road.								
Humacao West Portion	19	1430AST 1630AST			0	0		Flash Flood
Civil Defense indicated various mudslides in San Lorenzo, Cayey and Naranjito. Flooding was also reported in various sectors in								

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Crops	Character of Storm
<u>PUERTO RICO</u>									
			Cayey.						
San Juan San Juan	20	1450AST 1550AST			0	0			Urban/Sml Stream Fld
			A small stream and some roads flooded in Puerto Nuevo sector.						
San Juan Corozal	20	1730AST 1830AST			0	0			Urban/Sml Stream Fld
			A stream overflowed its banks.						
Ponce Juana Diaz	23	1600AST 1700AST			0	0			Urban/Sml Stream Fld
			Civil Defense in Juana Diaz reported that a flooded stream left highway impassable at Collores sector.						
Guayama Countywide	28	0600AST 1200AST			0	0	5K		Flash Flood
Humacao Countywide	28	0600AST 1200AST			0	0			Flash Flood
Ponce Countywide	28	0600AST 1200AST			0	0			Flash Flood
			A tropical wave caused heavy rains during the morning hours across most of the east and south sections of Puerto Rico. These rains produced flooding of several highways and landslides. Rio Blanco in Naguago went out of its banks. A temporarily bridge in Guayama was swept away by rising flood waters.						
<u>RHODE ISLAND</u>									
RIZ004			Eastern Kent						
	07	0000EST			0	0			Record Warmth
	09	2359EST							
			Record warm minimum temperatures were set at T.F. Green State Airport in Warwick. The low temperature of 73 degrees on the 7th broke the previous record of 71 degrees set in 1983. The low temperatures of 72 degrees on both the 8th and 9th broke the records of 70 degrees in 1936, and 70 degrees in 1992, respectively.						
Bristol County Bristol	10	0700EST 1900EST			0	0			Heavy Rain
Kent County Coventry	10	0700EST 1900EST			0	0			Heavy Rain
Newport County Portsmouth	10	0700EST 1900EST			0	0			Heavy Rain
Providence County Cumberland	10	0700EST 1900EST			0	0			Heavy Rain
Washington County Charleston Beach	10	0700EST 1900EST			0	0			Heavy Rain
Providence County Smithfield	10	1945EST 2145EST			0	0			Flash Flood
			Woonasquatucket River						
			A slow moving cold front, combined with tropical moisture arriving from the south, produced heavy rainfall throughout Rhode Island. The heaviest rain fell over northern Providence County, where totals of 6 to 7 inches were reported, including 6.81 inches in Johnston. Other areas received between 2 and 5 inches of rain. In Smithfield, in Providence County, heavy rainfall brought the Woonasquatucket River out of its banks and onto Route 104. No property damage was reported.						
Bristol County Countywide	16 17	1500EST 0200EST			0	0			Heavy Rain
Kent County Countywide	16 17	1500EST 0200EST			0	0			Heavy Rain

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops		

RHODE ISLAND

Newport County									
Countywide	16	1500EST			0	0			Heavy Rain
	17	0200EST							
Providence County									
Countywide	16	1500EST			0	0			Heavy Rain
	17	0200EST							
Washington County									
Countywide	16	1500EST			0	0			Heavy Rain
	17	0200EST							
RIZ001-003>005-007	Northwest Providence - Western Kent - Eastern Kent - Bristol - Newport								
	16	1700EST			0	0			Strong Wind
		2200EST							
RIZ002-006	Southeast Providence - Washington								
	16	1723EST			0	0			High Wind (G50)
		2200EST							
Kent County									
Warwick	16	2232EST			0	0			Flood
	17	1345EST							
	Pawtuxet River								
Providence County									
Cranston	16	2232EST			0	0			Flood
	17	1345EST							
	Pawtuxet River								

Tropical Storm Floyd brought high winds and torrential rainfall to Rhode Island, as it tracked from northern Connecticut into central and northeast Massachusetts. Although many areas received strong winds, the highest wind gusts were confined to coastal Washington County, where several trees were downed in Westerly, and also in northern Providence County, where branches, trees, and wires were downed in Smithfield, Woonsocket, and Cumberland.

Widespread rainfall amounts of 2 to 5 inches were reported throughout the Ocean State, with the heaviest amounts falling across the higher terrain of northwest Providence County. As much as 7.12 inches of rain fell in North Smithfield. The torrential rainfall caused the Pawtuxet River to rise out of its banks in Warwick and Cranston. The Pawtuxet went into flood at 1132 pm on the 16th, and crested at 9.4 feet at 515 am on the 17th, just over its 9 foot flood stage. It returned to its banks at 245 pm on the 17th. No flood damage was reported, including throughout the rest of Rhode Island where flooding of low lying areas was common.

RIZ003>007	Western Kent - Eastern Kent - Bristol - Washington - Newport								
	30	0900EST			0	0			Strong Wind
		1400EST							

Strong south winds developed across portions of Rhode Island ahead of an approaching cold front. The strongest winds were felt along the coast, where Block Island reported sustained winds over 30 mph. The only wind damage reported was an isolated tree down in Warwick.

SOUTH CAROLINA, Central

Clarendon County									
Manning	06	2030EST			0	0	0		Thunderstorm Wind (G50)
	Sheriff reported trees down on Breenin road.								
Clarendon County									
Paxville	06	2100EST			0	0	0		Thunderstorm Wind (G50)
	Sheriff reported trees down on vehicle on hwy 15.								
Clarendon County									
Paxville	06	2103EST			0	0	0	0	Hail (0.75)
	HAM operator reported dime size hail.								
Barnwell County									
Blackville to Hilda	07	1627EST			0	0	0		Thunderstorm Wind (G50)
		1637EST							
	Sheriff reported several trees down between Blackville and Hilda.								
Bamberg County									
Countywide	15	1400EST			0	0	0		Thunderstorm Wind (G50)
		1700EST							
	EPD reported scattered trees and powerlines down.								
Barnwell County									
Countywide	15	1400EST			0	0	0		Thunderstorm Wind (G50)
		1700EST							
	EPD reported scattered trees and powerlines down.								

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>SOUTH CAROLINA, Central</u>									
Orangeburg County Countywide	15	1445EST 1745EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Aiken County Countywide	15	1500EST 1800EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Calhoun County Countywide	15	1500EST 1800EST			0	0	0.10K	0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Edgefield County Countywide	15	1500EST 1800EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Clarendon County Countywide	15	1515EST 1815EST			0	0	237K	0	Thunderstorm Wind (G60)
			EPD reported scattered trees and powerlines down. One house and 3 mobile homes destroyed. Two homes had minor damage and 1 home had major damage.						
Lexington County Countywide	15	1530EST 1830EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Richland County Countywide	15	1530EST 1830EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Newberry County Countywide	15	1600EST 1900EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Fairfield County Countywide	15	1700EST 2000EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Kershaw County Countywide	15	1730EST 2030EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Sumter County Countywide	15	1730EST 2030EST			0	0	738K	0	Thunderstorm Wind (G65)
			EPD reported scattered trees and powerlines down. Eighty four homes had minor damage, 12 had major damage, and 10 mobile homes had minor damage.						
Lancaster County Countywide	15	1800EST 2100EST			0	0		0	Thunderstorm Wind (G50)
			EPD reported scattered trees and powerlines down.						
Lee County Countywide	15	1800EST 2100EST			0	0	8K	0	Thunderstorm Wind (G60)
			EPD reported scattered trees and powerlines down. 8K in damage was down to residential areas.						
Chesterfield County Countywide	15	1900EST 2200EST			0	0	150K	0	Thunderstorm Wind (G60)
			EPD reported scattered trees and powerlines down. 150K in damage was done to residential and business areas.						
Kershaw County Camden	21	1900EST 2200EST			0	0	50K		Flash Flood
			Sheriff reported rapid flooding in low lying areas of Camden with water depths around 2 feet in downtown and other areas.						

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

SOUTH CAROLINA, Central

Clarendon County

11 SSW Turbeville to 28 1845EST 0 0 0 Flash Flood
13 S Turbeville 2200EST

Sheriff and EPD reported flooding across hwy 527 between hwys 19 and 36.

SOUTH CAROLINA, North Coastal

Florence County

Scranton 06 1705EST 0 0 Hail (0.75)
1711EST

Horry County

2 SE Galivants Ferry 06 1815EST 0 0 Thunderstorm Wind (G65)
1820EST

A tree was downed along Highway U.S. 501 between Galivants Ferry and Aynor.

Florence County

Coward 06 1850EST 0 0 2K Hail (0.88)
1900EST

South Lynches FD reported nickel size hail and a couple of trees downed.

Horry County

Socastee to 07 0309EST 0 0 Flood
North Myrtle Beach 0700EST

During the early morning hours, a cluster of thunderstorms dropped up to 5 inches of rain in eastern Horry county. The rain, with less than adequate drainage, causing widespread ponding and road closures in the area. Water was as high as waist-deep between 7th and 8th Avenues South on Ocean Blvd.

Horry County

North Myrtle Beach to 15 1400EST 0 0 Flood
Conway 16 1300EST

Heavy rains associated with hurricane Floyd accumulated 15 to 20 inches in the eastern part of the county, causing flooding 3 feet deep in some areas and overwhelming drainage systems. The Waccamaw River gradually rose for the next week, finally cresting near record level and flooding more than 1700 dwellings.

Georgetown County

Murrells Inlet to 15 1430EST 0 0 Flood
Georgetown 16 1300EST

Heavy rains associated with hurricane Floyd accumulated 9 to 15 inches in the eastern part of the county, causing flooding 3 feet deep in some areas...especially around Murrells Inlet. The City of Georgetown was also flooded.

Dillon County

Lake View to 16 0100EST 0 0 Flood
Dillon 1300EST

Heavy rains associated with hurricane Floyd accumulated 6 to 9 inches in the eastern part of the county, causing flooding and road closures.

Marion County

Nichols to 16 0100EST 0 0 Flood
Marion 1300EST

Heavy rains associated with hurricane Floyd accumulated near 9 inches in the eastern part of the county and 3 inches on the west side. Flooding occurred in the Brittons Neck area and along Highway U.S. 76 from Nichols to Marion.

SCZ034-046

Horry - Georgetown

15 1800EST 0 0 Hurricane
16 0500EST

SCZ017-024-032>033-039

Marlboro - Dillon - Florence - Marion - Williamsburg

15 2100EST 0 1 High Wind (G58)
16 0400EST

The center of Hurricane Floyd, a category 3 storm, moved northeast about 60 miles off the coast of Georgetown County, and as close as 40 miles from North Myrtle Beach in Horry County before making landfall at Cape Fear NC as a category 2 storm. Wind gusts were recorded 50 to 60 mph in Georgetown, where bricks were lost from the city bell tower. Rainfall was heavy - around a foot of rain fell in Georgetown County and caused ponding and flooding of water. Otherwise damage was described as light.

In Horry County, winds gusted to 70 mph at Myrtle Beach, and trees were downed around the county. In Myrtle Beach, the cost due to tree and sign damage was more than \$250,000. Waves as high as 15' heavily damaged Cherry Grove Pier. Rainfall was heavy - near 18 inches in eastern Horry County, causing ponding of water waist-deep and many washouts from North Myrtle Beach to Garden City as drainage systems failed to accommodate the rain. Power was out to about 100,000 customers.

In Dillon County, high winds downed trees and power lines. About a half-foot of rain caused ponding. Ten dwellings were damaged by trees or flooding.

In Marion County, high winds downed trees and power lines. Heavy rains measured 5 to 10 inches and caused widespread ponding and road closures.

In Marlboro County, high winds downed few trees, but caused 1000 power outages scattered around the county.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	----------------------	--	---------------------	----------	-------	--------------------

SOUTH CAROLINA, North Coastal

In Williamsburg county, total damage estimates due to wind and rain ranged as high as \$650,000. Rainfall ranged from 4 to 10 inches, with the higher totals in the eastern part of the county causing flooding.
In Florence County, high winds downed trees and caused power outages. Damage to real property was \$150,000. About 4 inches of rain caused ponding, but no serious flooding was reported.

Darlington County

Clyde to 2 N Dovesville	29	1940EST 2005EST	15	20	0	6	240K	Tornado (F1)
------------------------------------	-----------	----------------------------	-----------	-----------	----------	----------	-------------	---------------------

A tornado touched down at Clyde, just west of the HB Robinson nuclear power plant, and tracked across the Pine Ridge area. The storm continued east-northeast, north of Hartsville across mostly rural areas, to near the Darlington County Jetport. There was spotty damage along a 15 mile path - 11 mobile homes were destroyed and 15 more were damaged. One house had major damage. Six businesses were listed as destroyed. Six injured people were treated and released.

SOUTH CAROLINA, Northwest

SCZ001>014-019

Northern Oconee - Northern Pickens - Northern Greenville - Southern Oconee - Southern Pickens - Southern Greenville - Spartanburg - Cherokee - York - Anderson - Abbeville - Laurens - Union - Chester - Greenwood
01 0000EST 0 0 Drought
30 2359EST

Rainfall continued to be scarce during the month of September, prolonging the drought conditions which existed through the summer. Although short term relief was provided by some light rain from the remnants of Hurricane Dennis and Hurricane Floyd itself across the extreme eastern parts of the Upstate, more wells ran dry and many more areas began mandatory water restrictions.

SCZ009

York
15 2000EST 0 0 High Wind (G40)
16 1500EST

Gusty winds between 35 and 45 mph around the periphery of Hurricane Floyd caused a few trees and power lines to fall, mainly near and east of Interstate 77.

Oconee County

4 E Walhalla	21	1527EST			0	0	Hail (0.75)
---------------------	-----------	----------------	--	--	----------	----------	--------------------

Dime size hail fell from a severe thunderstorm east of Walhalla.

Greenville County

Greenville	28	1730EST 1830EST			0	0	Flash Flood
-------------------	-----------	----------------------------	--	--	----------	----------	--------------------

An isolated and nearly stationary thunderstorm developed over the city of Greenville around the evening rush hour and caused severe urban flooding. Streets and yards were flooded and several cars were stalled out.

SOUTH CAROLINA, South Coastal

SCZ040-042>045-047>050

Allendale - Hampton - Northern Colleton - Dorchester - Berkeley - Jasper - Beaufort - Southern Colleton - Charleston
01 0000EST 0 0 Drought
29 2359EST

Severe drought conditions were down graded after several tropical systems and thunderstorms produced enough rain to make up most of the rainfall deficit over south coastal South Carolina.

Jasper County **6 NW Ridgeland**

	07	1610EST			0	0	Hail (0.88)
--	-----------	----------------	--	--	----------	----------	--------------------

Jasper County **Switzerland**

	07	1715EST			0	0	Hail (1.75)
--	-----------	----------------	--	--	----------	----------	--------------------

SCZ040-042>045-047>050

Allendale - Hampton - Northern Colleton - Dorchester - Berkeley - Jasper - Beaufort - Southern Colleton - Charleston
15 1200EST 0 0 17M Hurricane
16 0300EST

Hurricane Floyd weakened to a category three hurricane as it approached the southeast Georgia and southern South Carolina coasts on the morning of September 15th. The storm brushed the area during the late afternoon and evening as it took a more north and northeast course toward North Carolina. Sustained winds of tropical storm force were reported from Savannah on the southeast Georgia coast to Charleston on the South Carolina coast with wind gusts to hurricane force in the Charleston area. The highest sustained wind speed was 58 mph at the downtown Charleston office, which also had the highest gust (85 mph). In general, 3 to 5 inches of rainfall was reported across the area. Tides were 3.5 feet above normal with a maximum tide height 10.66 ft. ASL (7.71MLLW) at downtown Charleston. Minor to moderate beach erosion occurred along the South Carolina coast. Many businesses and homes suffered major damage with thousands of homes suffering at least minor damage in Charleston county, where 10.5 million dollars in damage was reported. Beaufort county reported 750,000 dollars damage with Berkeley and Dorchester counties reporting 500,000 dollars each. Well over a thousand trees were down, which contributed to over 200,000 people across south coastal South Carolina being without power at times on the night of September 15. There were sporadic reports of roofs being torn from homes or businesses across the area.

Dorchester County **Southeast Portion**

	28	1825EST 1940EST			0	0	Flood
--	-----------	----------------------------	--	--	----------	----------	--------------

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

SOUTH CAROLINA, South Coastal

Berkeley County

South Portion	28	1830EST			0	0			Flood
		1950EST							

Charleston County

North Charleston	28	1840EST			0	0			Flood
		2000EST							

Up to nine (9) inches of rain fell over portions of the tri-county area in just over 3 hours, causing 3 to 5 feet of standing water to flood numerous streets. Privacy fences were washed away and many cars stalled. Water was waist high in some homes in the Summerville area.

SCZ050

Charleston

29	1100EST			0	0			Flood
	1230EST							

Three inches of rain fell within a five hour time frame combined with high tide to produce 3 feet of standing water on several streets.

SOUTH DAKOTA, Central and North

Potter County

10 SE Gettysburg	02	2215CST			0	0	14K		Flash Flood
	03	0930CST							

Sully County

Onida	02	2215CST			0	0	275K		Flash Flood
	03	1850CST							

Faulk County

Seneca to	02	2230CST			0	0	10K		Flash Flood
Cresbard	03	0930CST							

Hughes County

Blunt	02	2230CST			0	0	175K		Flash Flood
	03	0930CST							

Hyde County

20 NW Highmore	02	2230CST			0	0			Flash Flood
	03	0930CST							

Stanley County

Ft Pierre	02	2230CST			0	0	20K		Flash Flood
	03	0930CST							

Brown County

Aberdeen to	03	0005CST			0	0	5K		Flash Flood
Hecla		0930CST							

Edmunds County

10 S Mina	03	0005CST			0	0	5K		Flash Flood
		0930CST							

Very heavy rains from thunderstorms repeatedly going over the same area resulted in extensive flash flooding in a 30 to 40 mile wide band from Fort Pierre in southeast Stanley County to Hecla in northeast Brown County. Rainfall amounts in this corridor ranged from 3 to 7 inches. As a result, the communities of Blunt in Hughes County and Onida in Sully county were severely flooded. Most of the homes and businesses were flooded throughout Blunt and Onida causing severe damage. Only a few homes in these communities were spared from receiving water in there basements. Most homes also experienced sewer backup. The sewer systems in both Onida and Blunt were flooded and shutdown. Many people had to go to temporary shelters as a result of the flooding. Aberdeen and Fort Pierre had a lot of street flooding resulting in road closures and detours. Also, several basements in Aberdeen and Fort Pierre had sewer backup.

The heavy rain flooded many township and county roads along with several state and U.S. highways. Sections of Highways 14, 20, 83, and 1806 along with many other roads in central and northeast South Dakota had to be closed. Many of the township and county roads had massive amounts of gravel washed away. Some bridges received minor damage with some culverts also lost. A few pets and livestock were also lost as a result of the flooding. Many acres of crops were flooded throughout the area. The DM & E railroad had some of its trackline flooded for a time. Some rainfall amounts included, 3 inches at Fort Pierre, 4 inches at Hecla and in the Aberdeen Area, 5 inches at the Sand Lake Wildlife Refuge and at Blunt, 6 inches at Seneca, 7 inches 10 miles southeast of Gettysburg and at Onida.

SDZ033

Stanley

03	0600CST			0	0			Flood
	2100CST							

As a result of the very heavy rains on the previous night and through the early morning hours, the Bad River rose to above flood stage at Fort Pierre. At Fort Pierre, the river rose to 21.85 feet in the late morning hours. Flood stage is 21 feet. The river fell quickly back to below flood stage in the late afternoon hours. Some lowland flooding resulted from the rise of the Bad River with no damage occurring.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

September 1999

SOUTH DAKOTA, Central and North

SDZ006

Brown

03 0600CST

0

0

Flood

30 2359CST

Very heavy rains of 3 to 5 inches from the previous night and into the early morning hours caused the James River at Columbia to rise above flood stage. The James rose above the flood stage of 13 feet on September 3rd and then rose to 14.63 feet on the 13th. The James continued above flood stage through the end of the month. As a result of the rise on the James, lowland and some agricultural land were flooded.

Hamlin County

Bryant

18 2145CST

0

0

Hail (1.75)

Stanley County

4 S Mission Ridge

25 1830CST

0

0

Hail (0.88)

Sully County

Onida

25 1928CST

0

0

Hail (0.88)

Sully County

Onida

25 1928CST

0

0

Thunderstorm Wind (G52)

Hand County

13 SE Miller

25 2045CST

0

0

Hail (0.88)

SOUTH DAKOTA, Southeast

Hanson County

Alexandria

03 1624CST

0

0

Hail (0.75)

Douglas County

Corsica to

2 E Delmont

04 0045CST

0

0

Flood

0245CST

Heavy rain of up to four inches closed a road just east of Delmont, and caused farmland and other lowland flooding.

Bon Homme County

10 N Avon to

Tabor

04 0100CST

0

0

Flood

0245CST

Up to 4 inches of rain caused flooding of farmland and other low areas, including park flooding in Tyndall.

Beadle County

8 W Virgil

25 2105CST

0

0

Hail (0.75)

Beadle County

Huron

25 2130CST

0

0

Hail (0.75)

SOUTH DAKOTA, West

Ziebach County

Dupree

11 0132MST

0

0

Hail (0.75)

SDZ013-032

Meade Co. Plains - Haakon

25 1550MST

0

0

High Wind (G54)

1658MST

A strong cold front swept through the region. Winds gusted over 50 kts for 15 to 30 minutes before decreasing again.

Ziebach County

13 W Cherry Creek

25 1707MST

0

0

Thunderstorm Wind (G56)

Lawrence County

8 W Spearfish

26 1310MST

0

0

Hail (0.75)

1312MST

TENNESSEE, Central

Sumner County

Portland

20 0330CST

0

0

40K

Lightning

Lightning struck the upper floor of a house and set it on fire. One of the rooms sustained heavy damage. Firemen were on the scene for about 3 1/2 hours. The house suffered considerable smoke and water damage.

TENNESSEE, East

NONE REPORTED.

TENNESSEE, West

Hardin County

Savannah

20 1620CST

0

0

25K

Thunderstorm Wind

1625CST

A couple of houses lost their roofs. Numerous trees were blown down.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

TEXAS, Central

Fisher County 4 N Roby

08 1800CST **0 0 10K** **Thunderstorm Wind**
Strong thunderstorm winds hit the Fisher County Airport on the evening of the 8th. A nearby garage suffered extensive damage when the roof collapsed, severely damaging the car parked inside. Also, a metal hangar located at the airport was partially destroyed.

Nolan County Sweetwater

12 1435CST **0 0** **Hail (0.88)**

Nolan County Sweetwater

12 1435CST **0 0 2K** **Thunderstorm Wind**
Several power lines and small trees were blown down across the city.

Nolan County Sweetwater

12 1445CST **0 0** **Flash Flood**
Rainfall amounts of 3 to 4 inches caused street flooding throughout the city of Sweetwater.

Taylor County 2 S Abilene

12 1524CST **0 0** **Hail (1.00)**

Fisher County 5 S Roby

12 1600CST **0 0** **Hail (0.75)**

Taylor County View

12 1600CST **0 0** **Flash Flood**
Rainfall totals of 3 to 4 inches caused street flooding in the community of View in central Taylor County.
A cluster of strong to severe thunderstorms developed over the Big Country during the afternoon of the 12th. Hail up to the size of quarters was reported just south of Abilene, along with torrential rainfall. In addition to hail up to the size of nickels, winds downed trees and power lines in Sweetwater.

Jones County 7 E Hawley

24 1950CST **0 0** **Hail (1.75)**

Taylor County Abilene

24 1954CST **0 0** **Hail (1.75)**

Taylor County Abilene

24 1954CST **0 0** **Thunderstorm Wind (G71)**
KTXS-TV in Abilene measured a wind gust at over 80 mph.

Taylor County Abilene

24 2004CST **0 0** **Hail (0.75)**

Shackelford County 5 SW Albany

24 2010CST **0 0** **Hail (2.75)**
Baseball size hail was reported across the southwest portions of Shackelford County.
An isolated severe thunderstorm moved across the Big Country on the evening of the 24th, producing very large hail and high winds. The city of Abilene took the brunt of the storm, when golf ball size hail and winds over 80 mph struck the north side of the city. Even larger hail up to the size of baseballs was reported just east of town in Shackelford County.

TEXAS, Central Southeast

Brazoria County 2 SE Freeport

02 0950CST **0 0 0** **Waterspout**

Brazoria County 12 W Freeport

02 1206CST **0 0 0** **Funnel Cloud**
Funnel cloud reported near CR 469 just off of FM 2918.

Harris County La Porte

08 1900CST **0 0 15K** **Hail (0.75)**

Galveston County Bacliff

28 1220CST **0 0 0** **Funnel Cloud**

TEXAS, Extreme West

NONE REPORTED.

TEXAS, Mid - South

Calhoun County Port O Conner

03 1015CST **0 0** **Waterspout**
1030CST
Waterspout reported by the Coast Guard.

Kleberg County Padre Ranger Stn

05 1315CST **0 0** **Funnel Cloud**
1330CST
Funnel cloud reported near Malaquite Beach along South Padre Island.

Storm Data and Unusual Weather Phenomena

September 1999

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
<u>TEXAS, Mid - South</u>									
Nueces County Corpus Christi	08	1425CST 1430CST			0	0			Funnel Cloud
Funnel cloud reported north of the National Weather Service Office in Corpus Christi.									
San Patricio County Mathis	28	1255CST 1300CST			0	0			Funnel Cloud
Funnel cloud spotted by Department of Public Safety.									
Calhoun County Port O Conner	28	1455CST 1500CST			0	0			Waterspout
Public report of a waterspout near Matagorda Bay.									
<u>TEXAS, North</u>									
Bell County Belton	02	2130CST			0	0	10K		Lightning
Somervell County Glen Rose	04	2200CST			0	0	100K		Lightning
Lightning started a fire that did over 100,000 dollars worth of damage to a barn and its contents.									
Montague County Forestburg	10	1750CST			0	0	0.10K		Thunderstorm Wind
A large tree was blown down onto a road near Forestburg.									
Tarrant County 2 NE Haslet	10	2000CST			0	0	10K		Thunderstorm Wind (G87)
Two eighteen wheelers were blown over by high winds on Interstate 35W, near Alliance Airport.									
Tarrant County 2 NE Haslet	10	2002CST			0	0			Thunderstorm Wind (G57)
Wind gust recorded at the ASOS site in the Alliance Airport.									
Denton County Roanoke	10	2010CST			0	0			Hail (1.75)
Denton County Roanoke	10	2015CST			0	0	1K		Thunderstorm Wind
Numerous horses were injured by flying debris.									
Denton County Countywide	10	2020CST			0	0	10K		Thunderstorm Wind
Thunderstorms caused widespread wind damage with numerous power lines down.									
Denton County Roanoke	10	2020CST			0	0	0.20K		Thunderstorm Wind
A large tree was blown down.									
Tarrant County Keller	10	2058CST			0	0	25K		Thunderstorm Wind (G69)
An athletic complex in Keller was unroofed by high thunderstorm winds.									
Montague County 3 W Spanish Ft	12	0115CST			0	0	10K		Thunderstorm Wind (G75)
A partially constructed oil storage tank was destroyed by very strong thunderstorm winds.									
Jack County Jacksboro	12	1755CST			0	0			Hail (1.00)
Denton County Lewisville	25	1745CST			0	0			Hail (1.75)
Dallas County Irving	25	1754CST			0	0			Hail (1.00)
Reported in South Irving.									
Dallas County Grand Prairie	25	1819CST			0	0			Hail (0.75)
Tarrant County Arlington	25	1842CST			0	0			Hail (0.75)
Hail fell in West Arlington.									
Tarrant County Arlington	25	1850CST			0	0			Hail (0.88)
Hail fell around Lake Arlington.									
Tarrant County Forest Hill	25	1910CST			0	0			Hail (1.00)

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>TEXAS, North</u>									
Tarrant County									
Everman	25	1922CST			0	0			Hail (0.75)
Dallas County									
Duncanville	25	1936CST			0	0			Hail (2.00)
			Hail fell in Southwest Duncanville, near Joe Pool Lake.						
Tarrant County									
Crowley	25	1946CST 1948CST			0	0			Hail (2.00)
Johnson County									
Burleson	25	1952CST			0	0			Hail (1.25)
Tarrant County									
Crowley	25	2000CST			0	0			Hail (0.75)
Johnson County									
Burleson	25	2139CST			0	0	25K		Thunderstorm Wind
			A mobile home and its contents were destroyed by high thunderstorm winds.						
<u>TEXAS, North Panhandle</u>									
Lipscomb County									
Lipscomb	03	1345CST			0	0	10K		Thunderstorm Wind (G61)
			Report of high winds tearing the tin off the side of a house and power poles blown down.						
			Severe thunderstorm with damaging winds moved across the northeastern Texas panhandle during the early afternoon hours.						
Gray County									
7 N Mc Lean	04	1542CST			0	0			Thunderstorm Wind (G61)
Moore County									
Cactus	04	2354CST			0	0			Thunderstorm Wind (G57)
			Severe thunderstorms developed during the late afternoon and late evening hours across the central Texas panhandle producing high winds.						
Lipscomb County									
Follett	12	0115CST			0	0	1K		Thunderstorm Wind (G61)
			Report of several windows broken.						
			A severe thunderstorm moved through the northeastern sections of the Texas panhandle during the early morning hours producing damaging winds.						
Oldham County									
10 S Boys Ranch	14	1625CST			0	0			Hail (0.75)
			Report of hail accumulation six inches deep.						
Lipscomb County									
Higgins	14	1630CST			0	0			Hail (0.75)
Oldham County									
10 S Boys Ranch	14	1636CST			0	0			Hail (0.75)
Oldham County									
4 W Wildorado	14	1713CST			0	0			Hail (1.00)
Potter County									
4 W Bushland	14	1728CST			0	0			Hail (1.00)
Potter County									
4 W Bushland	14	1728CST			0	0			Thunderstorm Wind (G57)
Hansford County									
Spearman	14	1815CST			0	0			Hail (0.75)
Deaf Smith County									
Dawn	14	1912CST			0	0			Hail (1.25)
			Severe thunderstorms moved across sections of the western and central Texas panhandle as well as the northern Texas panhandle during the evening hours. These storms produced mainly large hail with some high winds.						
Wheeler County									
3 ENE Briscoe	24	1809CST			0	0			Hail (1.00)
Wheeler County									
5 W Allison	24	1814CST			0	0			Hail (1.00)
			A severe thunderstorm over the extreme eastern section of the Texas panhandle produced some large hail during the early evening hours.						

TEXAS, Northeast

NONE REPORTED.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

TEXAS, South

NONE REPORTED.

TEXAS, South Central

Gonzales County

Gonzales **25** **0920CST** **0** **6** **0** **0** **Lightning**
In Gonzales, lightning struck a tree near where a crowd of people had gathered. Several people in the group were injured by the strike, including a 12-year old girl who was standing under the tree. The girl was knocked unconscious, and was taken to a local hospital where she was listed in critical condition with severe burns. She later recovered.

TEXAS, South Panhandle

Hockley County

Levelland **04** **1730CST** **0** **0** **15K** **Thunderstorm Wind**
Strong thunderstorm wind destroyed a carport, snapped power poles and blew down power lines.

Lubbock County

Reese Afb **05** **1837CST** **0** **0** **100K** **Hail (1.50)**

Lubbock County

Reese Afb **05** **1841CST** **0** **0** **100K** **Hail (1.75)**
A thunderstorm that developed over extreme southeastern Hockley County intensified as it moved very slowly northeast toward west-central Lubbock County. As it approached the county line southwest of Reese Center, the storm developed a strong anticyclonic mid-level rotation. Hail up to the size of golfballs was reported at the Reese Center golf course. A damage survey indicated a considerable amount of tree damage with leaves and limbs shredded but little to no property damage. The storm was rather short-lived, lasting about 45 minutes.

Castro County

Dimmitt **14** **2200CST** **0** **0** **100K** **Hail (1.00)**

Castro County

5 E Dimmitt **14** **2215CST** **0** **0** **20K** **100K** **Hail (2.00)**
Large, wind-driven hail broke windows between Dimmitt and Nazareth.

Castro County

5 W Dimmitt **14** **2235CST** **0** **0** **Flash Flood**
15 **0015CST**
Highway 86 west of town was reported flooded.

Castro County

3 N Dimmitt **14** **2245CST** **0** **0** **Flash Flood**
15 **0015CST**
Five feet of water was reported over Highway 385 north of town.

Hockley County

Anton **15** **1705CST** **0** **0** **100K** **Hail (1.00)**

Lubbock County

Lubbock **15** **1720CST** **0** **0** **150K** **Hail (1.25)**

Lubbock County

1 S Wolfforth **15** **1720CST** **0** **0** **1M** **Hail (1.75)**
Scattered strong to severe thunderstorms developed over the southwestern Panhandle and the western South Plains during the late afternoon of the 15th. The atmospheric conditions, specifically modest instability but strong wind shear, supported the development of several supercell thunderstorms. A few of these storms occurred over open country in Lamb, Bailey and Yoakum Counties. The strongest and longest-lived supercell that formed that afternoon moved from near Wolfforth in southwestern Lubbock County into western Garza County. Large hail, bigger than the size of golfballs at times, produced a damage swath to crops several miles wide from near Wolfforth to near Wilson. The largest hail occurred just north of Wayside in northern Lynn County, where cotton crops were destroyed. Despite the large hail size, property damage was notably absent during this event, in part due to the soft nature of the hailstones.

Lubbock County

2 N Slide **15** **1730CST** **0** **0** **1M** **Hail (1.25)**

Lubbock County

2 E Slide **15** **1750CST** **0** **0** **1M** **Hail (1.75)**
Quarter to golfball size hail damaged crops.

Lubbock County

Lubbock **15** **1800CST** **0** **0** **Flash Flood**
1900CST
The county EOC reported numerous roads flooded and closed across the city of Lubbock.

Lynn County

6 NW Wilson **15** **1815CST** **0** **0** **1M** **Hail (2.25)**
Hail larger than the size of golfballs destroyed crops along a several mile wide swath from northwest of Wayside across Highway 87 to near Wilson. The hail apparently was soft as a damage survey and interviews with citizens in the storm's path indicated little to no

Storm Data and Unusual Weather Phenomena

		Time	Path		Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm
<u>TEXAS, South Panhandle</u>									
		property damage.							
Lynn County Wilson	15	1825CST			0	0		200K	Hail (1.25)
Lynn County 3 N Grassland	15	1905CST			0	0		200K	Hail (1.75)
Yoakum County 5 W Plains	15	1950CST			0	0		100K	Hail (0.88)
<u>TEXAS, Southeast</u>									
Jasper County 1 E Jasper	08	1505CST			0	0	2K		Thunderstorm Wind
		Trees were blown down on FM 776.							
Newton County Newton	08	1550CST			0	0	2K		Thunderstorm Wind
		Trees blown down on Ben Lindsey Road.							
<u>TEXAS, West</u>									
Gaines County 15 NE Seminole	05	1655CST			0	0			Hail (0.75)
		A Lubbock TV chase crew drove into this hail at the intersection of FM 1066 and FM 303.							
Ector County 10 W Odessa	05	1900CST 2000CST			0	0	5K		Flash Flood
		Heavy rains from slowly moving thunderstorms totalled 3-4 inches in parts of West Odessa. Four houses were flooded and access to the area was difficult due to the high water. The American Red Cross set up a shelter overnight for those who were displaced.							
Ector County 10 NW Odessa	09	1640CST 1641CST			0	0			Funnel Cloud
		A tropical air mass, colliding boundaries, and a fresh updraft combined to produce a brief funnel cloud that was seen by many people from the northern parts of Odessa. The funnel was very thin and the cloud base quite high. The funnel never extended far from cloud base.							
Ector County Odessa	12	1730CST 1930CST			0	0	30K		Flash Flood
		Heavy rains from a nearly stationary cluster of thunderstorms dumped as much as 3.5 inches of rain in parts of Odessa. Most of the city received in excess of 1 inch. Numerous streets became flooded, cars were stranded, and even a few houses became flooded. In the worst areas, some cars were even washed into drainage ditches, but fortunately no injuries were reported.							
TXZ057		Van Horn/Guadalupe Mountains Area							
	28	1645MST			0	0			High Wind (G54)
	29	0300MST							
		Northeast winds in the wake of a cold front through Guadalupe Pass were sustained at over 40 mph for about 10 hours as high pressure filled into the region. The maximum sustained wind during the event was 51 mph and the peak gust was 62 mph.							
<u>TEXAS, Western North</u>									
Archer County 5 NNW Mankins	11	1749CST			0	0			Hail (0.88)
Wichita County 13 S Electra	11	1805CST			0	0			Hail (0.88)
Wilbarger County 1 E Harrold	11	2045CST			0	0			Hail (0.88)
Wichita County Wichita Falls	19	1830CST			0	0	2K		Lightning
		Lightning struck a large distribution transformer knocking out power for a short period of time.							
<u>UTAH, East</u>									
Uintah County 7 N Vernal	02	1710MST 1715MST			0	0			Funnel Cloud
Uintah County 2 WSW Naples to Naples	03	1415MST 1425MST	4	50	0	1	700K		Tornado (F1)
		The tornado was witnessed by many people in the Naples area, including law enforcement personnel. Several mobile homes were damaged or destroyed. Several garages and sheds were destroyed, with heavy debris strewn for hundreds of yards. Power poles and							

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

UTAH, East

Uintah County

Naples

trees were downed or pulled out of the ground, with some trees thrown up to a quarter mile away. Several houses were damaged from flying debris and fallen trees. A horse trailer was slammed against a structure. Gardens and hay pastures were leveled.

03 1520MST 0 0 40K Hail (1.75)
1525MST

Windows and vehicle windshields were broken. Roof shingles were damaged.

San Juan County

33 NW Monticello

16 1710MST 0 0 Hail (0.75)
1715MST

Nickel-sized hail pummeled the Needles area of Canyonlands National Park.

UTAH, West and Central

Carbon County

Price

01 1900MST 0 0 2K 1K Heavy Rain
2000MST

A heavy shower dumped 1 inch of rain in an hour in Price. Some minor street and yard flooding was reported.

Carbon County

Sunnyside

02 0945MST 0 0 0 0 Heavy Rain
1000MST

A thunderstorm produced brief heavy rain in Sunnyside, with .67 inches falling in 15 minutes.

Utah County

Provo to Orem

03 1515MST 0 0 0 0 Tstm Wind/Hail
1530MST

A severe thunderstorm produced 3/4 inch hail in northwest Provo, and 71 mph (62 kts) wind gusts in Orem.

Iron County

Cedar City

14 1500MST 0 0 0 0 Funnel Cloud
1515MST

A funnel cloud made a brief appearance near Cedar City.

Garfield County

Escalante

16 1430MST 0 0 0 0 Hail (1.00)
1500MST

A severe thunderstorm dumped 1 inch hail that piled up to 3-4 inches deep near Escalante. Snow plows had to be called in to clear Highway 12.

Garfield County

Hatch

18 1300MST 0 0 0 0 Heavy Rain
1400MST

Minor flooding was reported in Hatch, as 1.25 inches of rain was dumped in one hour.

Weber County

Roy

19 0930MST 0 0 10K 0 Lightning

Lightning struck a house in Roy, causing a fire in the crawl space.

Box Elder County

Park Vly

19 1500MST 0.5 20 0 0 0 0 Tornado (F0)
1530MST

Twin tornadoes touched down 20 miles south of Park Valley. They were over open country, with no injuries or damage reported. They stayed on the ground for nearly 3 minutes. The twisters were videotaped by some Elk hunters who happened to be in the area.

VERMONT, North and Central

Chittenden County

(Btv)Burlington Arpt to Essex Jct

08 1737EST 0 0 Heavy Rain
1856EST

A weak weather disturbance moved across New England during the afternoon of Wednesday, September 8th. This resulted in late afternoon and evening thunderstorms across northern Vermont. Locally heavy rainfall was reported...especially in the Burlington area. Thunderstorms reformed on the outflow boundary resulting in numerous thunderstorms moving over the same area. No flooding was reported, but ponding on area roadways caused difficult travel with some traffic lights becoming inoperable for a few hours. At the Burlington International Airport, 2.24 inches of rain fell setting a new 1 hour and 2 hour record rainfall rate. The rain was accompanied by wind gusts to 35 knots (40 mph).

VTZ010

Orange

16 2200EST 1 0 100K High Wind (G51)
17 1500EST

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England on Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. A death occurred when a tree fell on a mobile camper in Randolph, Vermont. Power outages were reported, especially in Randolph, Bradford and Wells River. Schools were closed in Bradford and Wells River. In Randolph, the wind reached

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	September 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage Property Crops	

VERMONT, North and Central

VTZ007	44 knots (51 mph). The annual "World's Fair", held in Tunbridge, Vermont was closed due to weather and power outages. Rainfall across the county associated with the remnants of Floyd was 5 1/2 to 6 1/2 inches. M69CA							
	Caledonia							
	16	2200EST			0	0	75K	High Wind (G52)
VTZ006	17	1500EST						
	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Numerous power outages were reported in the towns of Sheffield, Waterford and St. Johnsbury. Schools were closed in the St. Johnsbury area during Friday. Many power lines and trees were blown down in Groton State Forest. In Hardwick, Vermont the wind reached an estimated 52 knots (60 mph) with extensive tree damage. Rainfall across the county associated with the remnants of Floyd was 5 to 6 inches.							
	Lamoille							
VTZ012	16	2230EST			0	0	150K	High Wind (G52)
	17	1500EST						
	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Countywide, trees fell on several cars. Approximately 5000 people were without power in and around the towns of Stowe and Morrisville...with numerous power outages reported elsewhere in the county. A large tent was damaged at the car show in Stowe. Most schools in Lamoille county were closed on Friday. Hiking trails were damaged due to trees blown over and blocking them. The strongest wind reported was an estimated 52 knots (60 mph) in Stowe. Rainfall across the county associated with the remnants of Floyd was 5 to 7 inches but higher in the mountains. The highest amount was on top of Mt Mansfield with 11.38 inches..							
VTZ011	Windsor							
	16	2230EST			0	0	25K	High Wind (G34)
	17	1500EST						
VTZ011	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down with approximately 2,750 people without power countywide. Rochester had many trees blown down with schools closed Friday. In Springfield the strongest wind was 34 knots (39 mph). Rainfall across the county associated with the remnants of Floyd was around 6 inches but locally higher in the mountains.							
	Rutland							
	17	0200EST			0	0	100K	High Wind (G38)
VTZ003		1500EST						
	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down with numerous power outages. The towns of Chittenden, Mendon and Ira were especially hard hit with many trees blown down. The strongest wind reported at Rutland was 38 knots (44 mph). Rainfall across the county associated with the remnants of Floyd was 5 to 6 inches.							
	Orleans							
VTZ008	17	0300EST			0	0	100K	High Wind
		1500EST						
	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Approximately 10,000 people were without power. Trees were blown down blocking many area roads. Many schools were closed with numerous area events cancelled. The strong wind caused structural damage to a house in Craftsbury. In Irasburg a tree was blown down on a garage with structural damage. Elsewhere, damage resulted when a tree fell on a fire truck in the town of Coventry and another tree on a car in the town of Albany. A boat was damaged on Lake Memphremagog due to the wind and waves. Damage was reported to hiking trails due to trees blown down by the wind. Rainfall across the county associated with the remnants of Floyd was 5 to 7 inches.							
VTZ008	Washington							
	17	0330EST			0	0	75K	High Wind
		1500EST						
VTZ005	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Approximately 3,000 people were without power across the county. Cabot, Middlesex and Worcester were especially hard hit with many trees blown down. The strongest wind reported at Montpelier, Vermont was 27 knots (31 mph). Rainfall across the county associated with the remnants of Floyd was 5 to 7 inches with the highest in the mountains.							
	Chittenden							
	17	0330EST			0	0	150K	High Wind (G42)
VTZ005		1500EST						
	The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in a number of trees and power lines blown down. Significant tree damage was reported in Charlotte. A metal roof was blown off in Shelburne. In Colchester, a Drive-In theater screen was damaged. Numerous boats were damaged along the shore of Lake Champlain. The Lake Champlain Transportation Company suspended ferry service on both the Burlington, VT to Port Kent, NY and the Charlotte, VT to Essex, NY							

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

VERMONT, North and Central

VTZ004

lines, with waves of 8 to 10 feet reported. The strongest wind reported at the NWS office at Burlington Airport was 42 knots (48 mph) with higher gusts elsewhere in the county. Rainfall across the county associated with the remnants of Floyd was 4 1/2 to 6 1/2 inches with the highest amounts in the mountains.

Essex

17	0400EST 1500EST	0	0	25K	High Wind
----	--------------------	---	---	-----	-----------

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down. Approximately 3,000 people were without power. Trees were blown down blocking many area roads, with schools closed. There was some structural damage when trees fell on houses. Rainfall across the county associated with the remnants of Floyd was around 7 inches.

VTZ009

Addison

17	0400EST 1500EST	0	0	50K	25K	High Wind (G52)
----	--------------------	---	---	-----	-----	-----------------

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in many trees and power lines being blown down with an estimated 5000 people without power. A few boats were damaged along the shore of Lake Champlain. Damage was sustained to the apple orchards in both Shoreham and Cornwall. Many trees were blown down in both Hancock and Granville with schools closed on Friday. Numerous trees were blown down in Lincoln, Cornwall and Vergennes with roads blocked. The strongest wind reported was an estimated 52 knots (60 mph) in Cornwall. Rainfall across the county associated with the remnants of Floyd was 4 to 5 inches but locally around 6 inches in the mountains.

VTZ001

Grand Isle

17	0400EST 1500EST	0	0	50K	10K	High Wind (G43)
----	--------------------	---	---	-----	-----	-----------------

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in trees and power lines blown down. A few boats were damaged along the shores of Lake Champlain. An apple orchard sustained some damage in South Hero. The strongest winds reported were 43 knots (50 mph) in South Hero and on adjacent Lake Champlain...while in North Hero the winds reported were 32 knots (37 mph). Rainfall across the county associated with the remnants of Floyd was 3 1/2 to 4 inches.

VTZ002

Franklin

17	0500EST 1500EST	0	0	10K	High Wind
----	--------------------	---	---	-----	-----------

The remnants of Tropical Storm Floyd moved into southern New England Thursday night (9/16/99) and then across eastern New England Friday, September 17th. Strong winds combined with saturated soils from heavy rain resulted in trees and power lines being blown down. Numerous power outages were reported...especially in the St Albans area during Friday. Damage to hiking trails was also reported due to trees blown down by the wind. Rainfall across the county associated with the remnants of Floyd was 3 1/2 to 5 1/2 inches with the highest in the mountains.

Orange County

Wells River

17	0720EST 1100EST	0	0	1K	Flood
----	--------------------	---	---	----	-------

At 720 AM EST (820 AM EDT) the river gage at Wells River, VT was about 0.5 feet above flood state. Minor field flooding was reported during the morning hours.

VERMONT, South

VTZ013>014

Bennington - Windham

16	1840EST	0	0	325K	High Wind
17	1500EST				

Bennington County Countywide

16	2100EST	0	0	476K	Flood
17	1300EST				

Windham County Countywide

16	2100EST	0	0	300K	Flood
17	1400EST				

The remnants of Hurricane Floyd moved up the eastern seaboard on September 16 and during the early hours on September 17. The storm brought both high winds and heavy rainfall to Southern Vermont, which included a large swath of 3 to 6 inch amounts. Specific rainfall amounts included 2.91 inches in Bennington, 3.89 inches in Sunderland, 4.54 inches at Peru and 5.70 inches at Brattleboro. The rain produced significant flooding across the region, which proved destructive. Many smaller tributaries reached or exceeded bankfull. Water from the Millbrook in Weathersfield washed away a portion of State Route 5. The World's Fair in Tunbridge was cancelled for the first time in many years.

Winds from the passage of Floyd were estimated to have gusted to over 60 mph, especially over hilltowns. The combination of the wind and very saturated ground, produce widespread downing of trees and power lines across much of Southern Vermont. A woman was injured on Tavern Hill in Putney, Windham County when a tree came crashing down on her Volvo, destroying the vehicle. Some trees fell on vehicles and houses. The rain and wind produced power outages across the region. As many as 2,000 people lost power

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

VERMONT, South

in Southern Vermont.

VIRGIN ISLANDS

St. Croix County

St. Croix	19	0600AST 1800AST			0	0			Heavy Surf
-----------	----	--------------------	--	--	---	---	--	--	------------

A marine spotter indicated high northeast swells estimated at 8 to 10 feet along the north coast of St. Croix. These swells produced breaking waves greater than 10 feet and beach erosion.

St. Croix County

St. Croix	28	0400AST 1000AST			0	0			Flash Flood
-----------	----	--------------------	--	--	---	---	--	--	-------------

A tropical wave produced periods of heavy rains during the early morning hours. These rains flooded several highways and sectors throughout St. Croix and forced government offices, public and private schools and some businesses to close.

VIRGINIA, East

VAZ089>091-094>100 Surry - James City - York - Newport News - Norfolk - Suffolk - Chesapeake - Virginia Beach - Accomack - Northampton

01	0000EST				0	0	27K		Hurricane
05	2300EST								

Hurricane and Tropical Storm Dennis produced one of the most prolonged periods of tropical cyclone related conditions across eastern Virginia, from August 30th through September 5th. The highest sustained wind speed recorded was 52 mph at Langley Air Force Base (LFI). Other sustained wind speeds were 43 mph at the Norfolk International Airport (ORF), and 38 mph at Wallops Island. The highest gusts recorded were 76 mph at Langley Air Force Base, 53 mph at the Norfolk International Airport, and 46 mph at Wallops Island. A tornado rated an F2 occurred in association with Dennis and touched down in the city of Hampton. This tornado caused significant damage and numerous injuries. Otherwise, a few trees and power lines were blown down across the Hampton Roads area resulting in scattered power outages. The peak tidal departure at Sewells Point in Norfolk was around 3.0 feet above normal or 6.0 feet above MLLW. This resulted in moderate coastal flooding at the time of high tide. Rainfall amounts generally ranged from 2 to 5 inches across the Hampton Roads area and caused some street flooding. The lowest sea level pressure recorded was 1006.1 mb at the Norfolk International Airport.

Amelia County

Amelia	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Brunswick County

Lawrenceville	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Charles City (C)

Charles City	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Chesterfield County

Chesterfield	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Colonial Heights (C)

Colonial Hgts	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Cumberland County

Farmville	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Dinwiddie County

Dinwiddie	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Emporia County

Emporia	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Fluvanna County

Palmyra	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Franklin (C)

Franklin	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Goochland County

Crozier	01	0000EST			0	0			Heavy Rain
	05	2300EST							

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, East</u>									
Greensville County									
Skippers	01 05	0000EST 2300EST			0	0			Heavy Rain
Hanover County									
Ashland	01 05	0000EST 2300EST			0	0			Heavy Rain
Henrico County									
Sandston	01 05	0000EST 2300EST			0	0			Heavy Rain
Hopewell (C)									
Hopewell	01 05	0000EST 2300EST			0	0			Heavy Rain
Isle Of Wight County									
Isle Of Wight	01 05	0000EST 2300EST			0	0			Heavy Rain
King And Queen County									
Walkerton	01 05	0000EST 2300EST			0	0			Heavy Rain
King William County									
West Pt	01 05	0000EST 2300EST			0	0			Heavy Rain
Louisa County									
Louisa	01 05	0000EST 2300EST			0	0			Heavy Rain
Lunenburg County									
Lunenburg	01 05	0000EST 2300EST			0	0			Heavy Rain
Mecklenburg County									
Chase City	01 05	0000EST 2300EST			0	0			Heavy Rain
New Kent County									
New Kent	01 05	0000EST 2300EST			0	0			Heavy Rain
Nottoway County									
Blackstone	01 05	0000EST 2300EST			0	0			Heavy Rain
Petersburg (C)									
Petersburg	01 05	0000EST 2300EST			0	0			Heavy Rain
Powhatan County									
Powhatan	01 05	0000EST 2300EST			0	0			Heavy Rain
Prince Edward County									
Green Bay	01 05	0000EST 2300EST			0	0			Heavy Rain
Prince George County									
Prince George	01 05	0000EST 2300EST			0	0			Heavy Rain
Richmond (C)									
Richmond	01 05	0000EST 2300EST			0	0			Heavy Rain
Southampton County									
Courtland	01 05	0000EST 2300EST			0	0			Heavy Rain
Sussex County									
Wakefield	01 05	0000EST 2300EST			0	0			Heavy Rain
Hurricane and Tropical Storm Dennis produced heavy rainfall across central and south central Virginia. The heaviest rain occurred on September 4th and 5th. Most of the area received between 2.5 and 5 inches of rain. However, in Brunswick county, as much as 10.21 inches was recorded in Lawrenceville, and 6.19 inches was recorded in Alberta.									
Hampton (C)									
Hampton	04	1221EST	1	300	0	6	7.7M		Tornado (F2)
Tornado touchdown in the city of Hampton. Extensive structural damage in a 3 block area. Numerous minor injuries, with 6 people									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

VIRGINIA, East

transported to the hospital. Three apartment complexes and an assisted living facility condemned. Two additional apartment complexes partially condemned. There were 300 persons from apartment complexes forced to evacuate while 160 persons from the assisted living facility were forced to evacuate. Many roofs were lifted off buildings and as much as 800 vehicles were reported damaged. One 18 wheel tractor trailer was overturned. There was not a continuous damage swath, but areas where the tornado did not completely touch the ground. In some areas the tops of trees were sheared off. This tornado formed in the area ahead of the landfalling tropical storm/hurricane Dennis. There were 6600 persons without power.

Chesapeake (C) Chesapeake	07	0000EST 0600EST			0	0			Flash Flood
Norfolk (C) Norfolk	07	0000EST 0600EST			0	0			Flash Flood
Portsmouth (C) Portsmouth	07	0000EST 0600EST			0	0			Flash Flood
Suffolk (C) Suffolk	07	0000EST 0600EST			0	0			Flash Flood
Virginia Beach (C) Virginia Beach	07	0000EST 0600EST			0	0			Flash Flood
A slow-moving line of thunderstorms with very heavy rains caused numerous flooded roads throughout the area, with some secondary roads impassable.									
Suffolk (C) Whaleyville	07	1520EST			0	0			Hail (0.75)
Suffolk (C) Suffolk	07	1620EST			0	0			Flash Flood
Road (1500 block Camp Pond Road) flooded out.									
Louisa County 3 E Boswells Tavern	07	1900EST			0	0			Hail (0.88)
Prince Edward County Darlington Hgts	07	1915EST			0	0	2K		Thunderstorm Wind
Four large trees down including one snapped off half way up. Power lines also downed.									
Prince Edward County Hampden Sydney	07	1930EST			0	0	10K		Thunderstorm Wind
Spotter reported numerous large trees down. Downed trees caused some structural damage to a few homes.									
Henrico County Richmond Hgts	09	2145EST 2345EST			0	0			Flash Flood
Richmond (C) Richmond	09	2145EST 2345EST			0	0			Flash Flood

Slow-moving thunderstorms caused flooded roads. This flooding forced people to abandon vehicles.

VAZ077>078-084>086-089>091-093>100	Northumberland - Lancaster - Gloucester - Middlesex - Mathews - Surry - James City - York - Isle Of Wight - Newport News - Norfolk - Suffolk - Chesapeake - Virginia Beach - Accomack - Northampton								
15	1200EST	1	0	99.4M	42.3M	Hurricane			
16	1700EST								

Hurricane Floyd was a Category 1 hurricane as it crossed the Wakefield WFO county warning area. Sustained tropical storm force winds with gusts to near hurricane force occurred over the northwest quadrant of the storm over interior portions of northeast North Carolina and along the coastal waters of the Wakefield marine area. The center of the storm crossed the county warning area along an Elizabeth City to Currituck county to Sandbridge Virginia Beach axis. The highest sustained wind speed recorded was 69 mph at Chesapeake Light (CHLV2). Other sustained wind speeds were 46 mph at Langley Air Force Base (LFI), 44 mph at Norfolk Naval Air Station (NGU), and 41 mph at Oceana Naval Air Station (NTU). The highest gusts recorded were 100 mph at the James River Bridge, 84 mph at Chesapeake Light, and 63 mph at Langley Air Force Base. Two confirmed tornadoes occurred in association with Floyd. There were approximately several thousand persons evacuated and housed in several shelters from coastal jurisdictions. Hundreds of trees and power lines were blown down across interior southeast Virginia and the immediate Hampton Roads area, resulting in widespread power outages. The tidal departure at Sewells Point in Norfolk was 3.9 feet above normal or 6.4 feet above MLLW. This resulted in moderate to locally severe coastal flooding approximately 2 hours before high tide on the 16th. The tide gage in downtown Norfolk recorded a tide of 7.1 feet above MLLW. Flooding was more widespread during Hurricane Floyd due to extremely heavy rainfall before and during the peak storm tide. Storm surge flooding of 5 to 7 feet occurred over central portions of the Chesapeake Bay inundating sections of Accomack county. Some homes were flooded with 3 to 6 feet of water. The lowest sea level pressure recorded was 970 mb at Chesapeake Light (CHLV2).

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, East</u>									
Floyd will be remembered as an extremely wet hurricane for east-central Virginia. The presence of a stalled frontal boundary provided the focus for extremely heavy rains. Rainfall amounts averaged 10 to 20 inches in a 50 to 75 mile swath centered over the headwaters of the Chowan River Basin in interior southeast Virginia and northeast North Carolina extending into the middle peninsula. Numerous roads were washed out due to flooding. Primary routes out of service included US 460 near Wakefield, US 58 near Emporia and Franklin, and Interstate 95 south of Petersburg to Emporia. M69VE									
Northampton County									
Countywide	15	2015EST			0	0			Flood
	16	2000EST							
Chesapeake (C)									
Chesapeake	15	2030EST			0	0			Flood
	17	1200EST							
Franklin (C)									
Franklin	15	2030EST			0	0			Flood
	25	1800EST							
Isle Of Wight County									
Countywide	15	2030EST			0	0			Flood
	23	1800EST							
Norfolk (C)									
Norfolk	15	2030EST			0	0			Flood
	17	1200EST							
Portsmouth (C)									
Portsmouth	15	2030EST			0	0			Flood
	17	1200EST							
Southampton County									
Countywide	15	2030EST			0	0			Flood
	25	1800EST							
Suffolk (C)									
Suffolk	15	2030EST			0	0			Flood
	16	2000EST							
Hampton (C)									
Hampton	15	2130EST			0	0			Flood
	17	1200EST							
Newport News (C)									
Newport News	15	2130EST			0	0			Flood
	18	1200EST							
James City County									
Countywide	15	2200EST			0	0			Flood
	17	0600EST							
Poquoson County									
Countywide	15	2200EST			0	0	35K		Flood
	17	0400EST							
Surry County									
Countywide	15	2200EST			0	0			Flood
	19	1800EST							
Williamsburg (C)									
Williamsburg	15	2200EST			0	0			Flood
	17	0600EST							
York County									
Countywide	15	2200EST			0	0			Flood
	17	0600EST							
Gloucester County									
Countywide	15	2215EST			0	0			Flood
	16	2000EST							
Mathews County									
Countywide	15	2215EST			0	0			Flood
	16	2000EST							
Emporia County									
Emporia	16	0000EST			0	0	195K	55K	Flood
		2100EST							
Greensville County									
Countywide	16	0000EST			1	0	1.2M	800K	Flood
		2100EST							

F9VE

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, East</u>									
Petersburg (C)									
Petersburg	16	0000EST 2100EST			0	0	650K	200K	Flood
Prince George County									
Countywide	16	0000EST 2100EST			0	0	1.4M	900K	Flood
Sussex County									
Countywide	16 19	0000EST 1800EST			0	0	4.4M	1M	Flood
New Kent County									
Countywide	16	0145EST 2100EST			0	0	650K		Flood
King And Queen County									
Countywide	16	0200EST 2000EST			0	0	617K		Flood
King William County									
Countywide	16	0200EST 2000EST			0	0	275K		Flood
Lancaster County									
Countywide	16	0200EST 2000EST			0	0			Flood
Middlesex County									
Countywide	16	0200EST 2000EST			0	0			Flood
Mecklenburg County									
Countywide	16	0245EST 2000EST			0	0	153K		Flood
Chesterfield County									
Countywide	16	0445EST 2000EST			0	0	3M	50K	Flood
Colonial Heights (C)									
Colonial Hgts	16	0445EST 2000EST			0	0	1.2M		Flood
Dinwiddie County									
Countywide	16 20	0445EST 1800EST			0	0	870K	420K	Flood
Brunswick County									
Countywide	16	0515EST 2000EST			0	0	300K		Flood
Northumberland County									
Countywide	16	0515EST 2000EST			0	0			Flood
Nottoway County									
Countywide	16	0515EST 2000EST			0	0	18K		Flood
Richmond County									
Countywide	16	0515EST 2000EST			0	0	654K	200K	Flood
Richmond (C)									
Richmond	16	0515EST 2000EST			0	0	176K		Flood
Westmoreland County									
Countywide	16	0515EST 2000EST			0	0	195K	55K	Flood
Amelia County									
Countywide	16	0530EST 2000EST			0	0	8K		Flood
Essex County									
Countywide	16	0530EST 2000EST			0	0	195K	20K	Flood

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

VIRGINIA, East

Hanover County Countywide

16 0530EST
2000EST 0 0 67K Flood

Henrico County Countywide

16 0530EST
2000EST 0 0 600K Flood

Lunenburg County Countywide

16 0530EST
2000EST 0 0 50K Flood

Caroline County Countywide

16 0600EST
2000EST 0 0 122K Flood

Very heavy rain from Hurricane Floyd produced widespread flooding and flash flooding across much of central and eastern Virginia, and northeast North Carolina. Rainfall amounts generally ranged from near 7 inches from eastern Caroline county to Richmond City to Brunswick, Lunenburg and Mecklenburg counties, to 12 to 18 inches in much of the Virginia Tidewater. Numerous roads were washed out due to flooding. Many areas normally prone only to flooding of poor drainage and low lying areas experienced significant flash flooding. Primary routes out of service included US 460 near Wakefield, US 58 near Emporia and Franklin, and Interstate 95 south of Petersburg to Emporia. River flooding was extensive and prolonged in the Chowan River Basin. The Blackwater, Meherrin and Nottoway Rivers exceeded flood stage. Water levels in the city of Franklin were estimated to be several feet above the flood of record which occurred in August 1940. The flooding was considered to be a 500 year flood of record. Also, there were enormous agricultural/crop losses due to the flooding.

VAZ063>064-070>073- 079>083-087>088-092 Hanover - Caroline - Chesterfield - Henrico - King William - King And Queen - Brunswick - Dinwiddie - Prince George - Charles City - New Kent - Greenville - Sussex - Southampton

16 0400EST
1500EST 0 0 53K High Wind

Numerous trees and power lines were blown down across central and interior southeast Virginia, resulting in widespread power outages.

Fluvanna County Countywide

29 2335EST
Numerous trees down. 0 0 3K Thunderstorm Wind

Louisa County Countywide

29 2350EST
Numerous trees down. 0 0 3K Thunderstorm Wind

Amelia County Amelia

30 0010EST
Roof was blown off a barn just northeast of Amelia courthouse. 0 0 5K Thunderstorm Wind

Henrico County Short Pump

30 0022EST
Trees down. 0 0 2K Thunderstorm Wind

Caroline County Return

30 0028EST
Trees down on Route 681 near Route 17. 0 0 2K Thunderstorm Wind

Richmond (C) Richmond

30 0035EST
Numerous trees down. Trees down on vehicles. 0 0 4K Thunderstorm Wind

VIRGINIA, Extreme Southwest

NONE REPORTED.

VIRGINIA, North

VAZ021-025>031- 036>042-050>057

Highland - Augusta - Rockingham - Shenandoah - Frederick - Page - Warren - Clarke - Nelson - Albemarle - Greene - Madison - Rappahannock - Fauquier - Loudoun - Orange - Culpeper - Prince William - Fairfax - Arlington - Stafford - Spotsylvania - King George

01 0000EST
30 2359EST 0 0 5M Drought

Rainfall from two land falling hurricanes made a tremendous impact on the drought that plagued the region since the summer of 1998. Across Northern Virginia, the greatest amount of rain fell north of a line from Staunton to Fredericksburg. The water shortage came to an end in this area by mid month. Locations to the south recorded a major increase in water supplies, upgrading their condition from an extreme drought to a mild drought, but not enough rain fell to completely wipe out the shortage. Washington Reagan National Airport in Arlington reported a rainfall total of 10.27 inches for September, 6.96 inches above normal. It was the 4th wettest September on record. Dulles International Airport received 9.32 inches of rain, 5.96 inches above normal. Other monthly rainfall totals included Rappahannock County at 14.8 inches, Clarke County at 13.0 inches, Page County at 12.8 inches, Warren County at

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, North</u>									
12.5 inches, Culpeper County at 11.9 inches, Greene County at 11.3 inches, Fauquier County at 11.0 inches, Spotsylvania County at 10.0 inches, Loudoun County at 9.9 inches, Fairfax County at 9.7 inches, Orange County at 9.4 inches, Shenandoah County at 9.1 inches, Augusta County at 9.0 inches, Frederick County at 8.3 inches, Prince William County at 7.7 inches, Rockingham County at 7.5 inches, and Albemarle County at 7.0 inches.									
The much needed rainfall affected rivers and water reservoirs dramatically. In Shenandoah County, 30 ponds that went dry during the past 12 months were rejuvenated by the 8th. Orange County lifted its water restrictions on the 10th. The Ni River Reservoir returned to 71% of its capacity by the end of the month, allowing officials in Spotsylvania County to lift mandatory water restrictions that were in effect for 13 months. Streamflow at Goose Creek in Loudoun County increased from 3.8 million gallons during the last week of August to 20 million gallons by the 8th. The South Fork of the Shenandoah River in Front Royal finally rose to a sufficient level to allow water to rush over the dam, following a several month absence. The Charlottesville urban water ring recorded a reservoir level increase from 80% to 94% of capacity by mid month. Mandatory water restrictions continued in Highland County through the end of the month.									
Effects of the drought still lingered in the agricultural community. Across the state by the end of the month, 27% of pasture land, 40% of corn, 16% of soybeans, and 12% of apples remained in poor or very poor condition. Rockingham County, Virginia's top agriculture county, reported 90% of the corn crop and 85% of the soybean crop were lost due to the drought. Loudoun County increased their estimate of drought crop losses from \$15 to \$20 million by the end of the month. The apple harvest in Nelson County yielded a crop smaller than the 2.5 inch minimum standard. Farmers had to sell the crop to apple juice suppliers instead of wholesale markets, significantly reducing profit. Statewide by the 26th, 25% of topsoil remained short or very short of moisture. In addition, harvests were made difficult by heavy rains from the tropical systems. Effects such as shortages of hay and pasture land for livestock, stunted tree growth at orchards and tree farms, and low prices for meagre harvests continued to plague farmers, even after water supplies rebounded.									
Clarke County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Culpeper County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Fauquier County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Frederick County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Greene County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Madison County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Orange County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Rappahannock County									
Countywide	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Winchester (C)									
Winchester	05	0200EST			0	0			Heavy Rain
	06	1000EST							
Alexandria (C)									
Alexandria	05	0300EST			0	0			Storm Surge
	06	2000EST							
2 feet rise in tide levels on Potomac River, minor flooding near waterfront									
Highland County									
Monterey	05	0300EST			0	0			Flash Flood
		0930EST							
Tropical rainfall up to 5 inches									
Albemarle County									
Countywide	05	0400EST			0	0			Flash Flood
		1030EST							
Tropical rainfall up to 4 inches									

Storm Data and Unusual Weather Phenomena

September 1999

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage	Crops	Character of Storm
<u>VIRGINIA, North</u>									
Augusta County Countywide	05	0400EST 1030EST			0	0	20K		Flash Flood
			Tropical rains flooded roads, felled trees, and forced creeks out of their banks						
Charlottesville (C) Charlottesville	05	0400EST 1030EST			0	0			Flash Flood
			Tropical rainfall up to 4 inches						
Harrisonburg (C) Harrisonburg	05	0400EST 1030EST			0	1	10K		Flash Flood
			Flooded roads, collapsed roof						
Nelson County Countywide	05	0400EST 1030EST			0	0			Flash Flood
			Tropical rainfall up to 6 inches						
Page County East Portion	05	0400EST 1030EST			0	0			Flash Flood
			Tropical rainfall up to 5 inches along Skyline Drive						
Rockingham County Countywide	05	0400EST 1030EST			0	0			Flash Flood
			Tropical rainfall up to 5 inches, standing water in low lying areas						
Shenandoah County Countywide	05	0400EST 1030EST			0	0			Flash Flood
			Tropical rainfall up to 4 inches, low water crossings flooded						
Staunton (C) Staunton	05	0400EST 1030EST			0	0	7K		Flash Flood
			Saturated soil allowed trees to topple onto 4 vehicles						
Warren County East Portion	05	0400EST 1030EST			0	0			Flash Flood
			Tropical rainfall up to 6 inches along Skyline Drive						
Waynesboro (C) Waynesboro	05	0400EST 1030EST			0	0	5K		Flash Flood
			Saturated soil allowed trees and power lines to topple						
VAZ037 Albemarle	05	1130EST 1600EST			0	0			Strong Wind

Winds gusting over 40 MPH and saturated soil combined to down trees and power lines

The remnants of Hurricane Dennis moved across the northern half of Virginia from midday on the 4th through midday on the 6th. Its legacy included very heavy rain, especially in the Virginia Highlands and the Central and Southern Shenandoah Valley, and wind gusts in excess of 45 MPH. The heaviest period of rain in th this region occurred between 3:00 AM and 8:00 AM on the 5th. Portions of Highland County received up to 5 inches of rain during this period. Rainfall totals across the county across the county from Dennis included 8.40 inches at Monterey, 4.08 inches at Hightown, 3.39 inches at McDowell, and 2.64 inches at Back Creek. In Staunton, the soil became so saturated that an 18 inch diameter tree toppled onto a fence and 4 parked cars, resulting in \$7000 damage. In Waynesboro, trees and power lines in saturated soil fell causing power outages. Extremely heavy rain fell in the Sherando area of Augusta County, causing widespread flooding. Much of the 6.52 inches of rain Sherando and 9.25 inches of rain Upper Sherando received from the tropical system fell during this time. Back Creek flooded, sending a high volume of water downstream toward Lyndhurst. Several trees fell in the Sherando and Stewarts Draft area after soil became too wet to secure the roots. Route 624 near Stewarts Draft was closed by high water. Other rainfall totals from Dennis around the county included Mills Creek Dam at 9.48 inches, Tom's Branch at 8.10 inches, Spottswood at 5.48 inches, Robinson's Hollow at 5.32 inches, Stewart's Draft at 5.10 inches, Staunton at 4.85 inches, Waynesboro at 4.47 inches, and Stokesville at 4.24 inches, Heavy rain also fell across Albemarle County and the city of Charlottesville, closing the county fair a day early. Free Union reported a storm total of 4.60 inches.

Across Nelson County, Dennis dropped 9.51 inches in Montebello, 6.87 inches in Lovingson, 6.68 inches at Brent Gap, 5.08 inches at Bent Creek, and 4.80 inches in Rockfish. Rockingham County and the city of Harrisonburg reported several low lying areas and roads covered by water after the deluge. A roof collapsed in Harrisonburg around 10:00 AM EDT, injuring one occupant. Rainfall totals included 6.50 inches at Briery Branch, 6.32 inches at Dundore Mountain, 5.92 inches at Bergton, and 5.40 inches at Lynwood. Across Shenandoah County, Zepp reported 6.80 inches, Camp Roosevelt reported 5.76 inches, Strasburg reported 5.03 inches, Fetzer

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

VIRGINIA, North

Gap reported 4.51 inches, and Bryce Mountain reported 4.28 inches. Several low water crossings were closed by high water. Along Skyline Drive in extreme eastern Page and Warren Counties, rainfall amounts between 4 and 6 inches fell during the morning of the 5th. Storm total rainfall along the Blue Ridge Mountains included 8.57 inches at Lewis Mountain, 7.00 inches at Matthews Arm, 6.96 inches at Limeton, and 6.16 inches at Rocky Branch.

On the afternoon of the th 5th, winds occasionally gusted over 40 MPH in the Southern Shenandoah Valley. Saturated soil from the morning's heavy rainfall made it very easy for strong winds to blow down several trees and power lines in the city of Charlottesville and Albemarle County. Nearly 10,000 customers lost power. At 2500 feet on the top of Flattop Mountain in Greene County, a wind gust of 62 MPH was recorded around 1:10 PM EDT.

Other locations across Northern Virginia received periods of heavy rain from late on the 4th through early on the 6th. Rainfall totals in Madison County included 3.80 inches at Syria, 2.84 inches at Madison, and 2.72 inches at Nethers. Standardsville in Greene County reported 3.62 inches. In Orange County, 2.94 inches fell at Somerset and 2.83 inches fell at Orange. 2.72 inches fell at Boston in Culpeper County. In Rappahannock County, 3.87 inches fell at Sperryville and 3.50 inches fell at Castleton. In Fauquier County, The Plains reported 3.53 inches and Remington received 2.30 inches. The town of Gore in Frederick County received 3.94 inches. The city of Winchester had rainfall totals ranging from 4.52 inches south to 2.27 inches north. A rain gauge near Berryville in Clarke County received 2.52 inches.

The city of Alexandria along the tidal Potomac River also reported minor problems with flooding. The storm surge from Hurricane Dennis along with persistent southeast winds made tide levels 2 to 3 feet above normal on the 5th and 6th. At high tide portions of the city near the waterfront were invaded by water which subsided again with each low tide. The 100 block of King and Union Streets was flooded for a time on Sunday. River levels reached as high at 6.5 feet at the Wisconsin Avenue gauge during the early morning and late afternoon both days.

Frederick County Countywide	07	1800EST 2200EST			0	0			Flash Flood
			Quickly rising water closed several roads and caused mudslides						
Clarke County Countywide	07	1830EST 2200EST			0	0			Flash Flood
			Quickly rising water flooded roads in Berryville and Boyce						
Orange County Gordonsville	07	1945EST			0	0	3K		Thunderstorm Wind
			Several trees downed						
Shenandoah County North Portion	07	2000EST 2300EST			0	0			Flash Flood
			Roads closed by high water in Strasburg, flooding in north portion of county						
Frederick County Stephens City	07	2015EST			0	0			Hail (0.75)
			Dime sized hail						
Clarke County Countywide	07	2100EST			0	0	5K		Thunderstorm Wind
			Trees downed across roads countywide						
Warren County Front Royal	07	2200EST			0	0			Lightning
			House struck by lightning						
Warren County Front Royal	07	2200EST			0	0	20K		Thunderstorm Wind
			Winds estimated between 70 and 80 MPH downed trees and damaged structures						
Loudoun County Countywide	07	2230EST			0	0	2K		Thunderstorm Wind
			Trees downed across roads countywide						

Only a few days after Northern Virginia received rains from the remnants of Hurricane Dennis, an area of thunderstorms moved through the area producing damaging winds, large hail, frequent lightning, and very heavy downpours. The storms affected the region between 5:30 PM EDT and midnight. Frederick and Clarke Counties received the heaviest rainfall, and suffered from Significant flash flooding. An observer in Clearbrook reported a rain gauges that held 5 inches overflowed during the storm. Another observer in the eastern half of Frederick County received a total of 5.3 inches, with 3.5 inches of the total recorded in 1 hour. One location in Clarke County reported 3.8 inches of rain in 1 hour. A portion of Highway 7 was closed by high water near Berryville. Both Boyce and Berryville reported street flooding. The communities of Greenwood and Stephens City reported several flooded roads and basements. Severe flooding and mudslides blocked roads between Highway 7 and Route 50, and another mudslide affected Route 50. In addition, Route 635, 657, 255, 621, 620, 651, and 761 were all closed for a short period of time due to high water in Clarke

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Injured Persons	Estimated Damage Property Crops	Character of Storm	
<u>VIRGINIA, North</u>									
County. Shenandoah County also received heavy rain and reported minor flooding. Just south of Strasburg, 1.5 inches fell. County officials reported a low lying bridge on Highway 744 was covered with water in the Deer Rapids area near Massanutten Mountain. A low water bridge at Black Bear Crossing east of Maurertown and at Chapman's Landing south of Woodstock were also flooded and impassable. Several basements and roads were flooded in Strasburg. IN addition, winds in excess of 55 MPH downed trees and power lines in several locations. Several trees were downed in the eastern part of Frederick County. Power lines were downed and lightning started several tree fires in the Greenwood area. Trees were downed across Clarke County with a concentration in the Berryville area. Utility crews had to clear downed trees in Waterford and Leesburg in Loudoun County. In Orange County, several trees were downed by high wind in Gordonsville. Dime sized hail fell in Stephens City, and pea sized hail fell in Leesburg. Winds estimated between 70 and 80 MPH pummelled Front Royal around 11:00 PM EDT. The area of town east of Route 350, south of Main Street, west of Route 522, and north of Route 55 was hardest hit. Part of a roof was torn off a home and a few chimneys were blown down. Other homes had roof , siding, and trim damage. At least a dozen trees were uprooted and many more were snapped. Numerous trees lost large limbs. Two houses had large trees fall on them and one car was crushed by a tree. Two sheds were damaged. Two stores in a shopping center south of Route 522 and south of Route 55 had trim damage. Another portion of town north of Route 55 and east of Route 522 around Jamestown and Marshall Streets also had several large hardwood trees that were snapped by winds in excess of 55 MPH. One home in the Lake Front Royal subdivision was hit by lightning. Many residents in the southern part of the city lost power after trees fell onto power lines.									
Nelson County Afton	09	1350EST			0	0		Hail (0.75)	
Dime sized hail on Afton Mountain									
Waynesboro (C) Waynesboro	09	1500EST 1700EST			0	0		Flash Flood	
Small streams out of banks, Kirby Avenue and A Street flooded									
Waynesboro (C) Waynesboro	09	1510EST			0	0	5K	Thunderstorm Wind	
Trees and power lines downed									
Albemarle County Countywide	09	1600EST 1745EST			0	0		Flash Flood	
Flooding concentrated between Charlottesville and Afton Mountain									
Greene County Countywide	09	1645EST 1800EST			0	0		Flash Flood	
Flooding along North Fork of Rivana River									
Nelson County Countywide	09	1700EST 1900EST			0	0	15K	Flash Flood	
Mudslide on Highway 29 near Route 617, water over roads in Lovingsston and Faber, trees and power lines downed									
Madison County Countywide	09	1715EST 1730EST			0	0	10K	Thunderstorm Wind	
Trees downed									
Fairfax County Mc Lean	09	1720EST			0	0	0.50K	Thunderstorm Wind	
Tree downed									
Albemarle County Free Union	09	1730EST			0	0	2K	Thunderstorm Wind	
Trees downed									
Culpeper County Culpeper	09	1800EST 2000EST			0	0		Heavy Rain	
Streets flooded									
Loudoun County Countywide	09	1800EST 1830EST			0	0		Heavy Rain	
Streets flooded in Leesburg and Arcola									
Loudoun County Arcola	09	1810EST			0	0	2K	Thunderstorm Wind	
Trees downed along Route 621 and 659									
Rappahannock County Sperryville	09	1900EST 2000EST			0	0		Flash Flood	
Streets and creeks flooded									
A round of thunderstorms producing damaging winds, hail, and very heavy rainfall moved across Northern Virginia between 2:30 PM									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

VIRGINIA, North

and 9:00 PM EDT. The city of Waynesboro reported downed trees and power lines after winds between 50 and 60 MPH moved through. A quick 1.79 inches of rain flooded many roads including Kirby and A Streets, and sent small creeks out of their banks. Nelson County reported a long period of stormy weather. Pea to dime sized hail fell on Afton Mountain between 2:45 PM and 2:50 PM EDT. Heavy rains fell across the remainder of the county for the following two hours, flooding roadways and causing a mudslide that blocked Highway 29 near Route 617. Streets were flooded in Lovingson and Faber. A gauge at Rockfish recorded 1.77 inches of rain in 60 minutes, and another gauge 10 miles south of Schuyler reported a total of 2.44 inches. High winds also knocked down a number of trees and power lines across Nelson County. Albemarle County reported 227 power outages after high winds downed trees onto power lines in the Free Union area. Heavy rain also pounded the county, flooding roads between Charlottesville and Afton Mountain. In Greene County, the North Fork of the Rivana River swelled out of its banks. High winds across Madison County downed several trees between 6:15 PM and 6:30 PM EDT. The city of Madison received 2.59 inches of rain, and a gauge northwest of town on the edge of Shenandoah National Park reported 1.93 inches. In Culpeper County, several streets in the city of Culpeper flooded. The city of Sperryville in Rappahannock County also reported flooded roadways. Castleton reported 2.2 inches of rain and Massie's Corner reported 1.52 inches. Nearby in Front Royal, 2.38 inches fell. In Loudoun County, city streets were flooded in Leesburg and Arcola. Dulles International Airport received a total of 1.33 inches. The community of Arcola was also hit by 50 to 60 MPH winds which downed trees onto Route 621 and 659. Fairfax County also reported high winds which downed trees between McLean and the city of Fairfax.

Fredericksburg (C) Fredericksburg

16	0800EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

High water closed some roads

King George County Countywide

16	0800EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

High water closed numerous roads

Spotsylvania County Countywide

16	0800EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

High water closed some roads

Stafford County Countywide

16	0800EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

High water closed some roads

VAZ028-030>031-042-056 Frederick - Warren - Clarke - Loudoun - Spotsylvania

16	0800EST 2300EST			0	0	42K			High Wind
----	--------------------	--	--	---	---	-----	--	--	-----------

VAZ052>055-057 Prince William - Fairfax - Arlington - Stafford - King George

16	0800EST 2300EST			1	0	220K			Tropical Storm
----	--------------------	--	--	---	---	------	--	--	----------------

F61UT

Warren County East Portion

16	0800EST 1500EST			0	0				Heavy Rain
----	--------------------	--	--	---	---	--	--	--	------------

Rainfall in highest elevations between 3 and 4 inches

Alexandria (C) Alexandria

16	1100EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

Arlington County Countywide

16	1100EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

Fairfax County Countywide

16	1100EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

7 major intersections and 20 secondary roads affected by flooding

Fairfax (C) Fairfax

16	1100EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

Roads closed by high water

Falls Church (C) Falls Church

16	1100EST 1500EST			0	0				Flash Flood
----	--------------------	--	--	---	---	--	--	--	-------------

Storm Data and Unusual Weather Phenomena

		Time	Path		Number of		Estimated	September 1999	
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		
Location	Date						Property Crops	Character of Storm	
<u>VIRGINIA, North</u>									
Manassas (C)									
Manassas	16	1100EST 1500EST			0	0		Flash Flood	
		Some secondary roads flooded							
Manassas Park (C)									
Manassas Park	16	1100EST 1500EST			0	0		Flash Flood	
		Some secondary roads flooded							
Prince William County									
Countywide	16	1100EST 1500EST			0	0		Flash Flood	
		Some secondary roads flooded							
		Hurricane Floyd made landfall just east of Cape Fear, North Carolina in the early morning hours of the 16th and moved north-northeast across extreme southeast Virginia to near Ocean City, Maryland by evening on the 16th. Rainbands on the outer edge of the hurricane began to affect northern Virginia shortly after 8:00 AM EDT on the 15th and continued to cross the area through afternoon on the 16th. The eye of Hurricane Floyd passed east of the Chesapeake Bay between 9:00 AM and midnight on the 16th. Gusty winds of 30 to 50 MPH blew north and east of a line from Spotsylvania County to Frederick County between 11:00 AM and midnight on the 16th. Hundreds of trees were downed from the combination of very heavy rain and strong winds. A total of 2 to 5 inches of rain fell in this area and 16,000 power outages were reported. Rainfall reports of over 3 inches included 5.97 inches in Spotsylvania, 4.57 inches at Washington National Airport, 4.55 inches in Annandale, 4.03 inches in Fairfax Station, 3.55 inches in Reston, 3.38 inches in Herndon, 3.36 inches in Great Falls and Chester Gap, and 3.32 inches at Hogback Mountain. Peak wind gusts included 55 MPH at National Airport at 3:00 PM EDT, 45 MPH in Herndon at 4:01 PM EDT, 43 MPH in Manassas at 4:09 PM EDT, 41 MPH in Alexandria at 3:55 PM EDT, 40 MPH in Chantilly at 3:47 PM EDT, and 39 MPH at Dulles Airport at 3:43 PM EDT.							
		In Spotsylvania County, several trees were downed and high water closed several roads in the eastern portion of the county. King George County and Stafford County reported numerous downed trees and several roads closed by high water. In Prince William County, 17 trees came down on roads and power lines, and two homes were slightly damaged by fallen trees. In the Montclair area, 1000 residents lost power. Some secondary roads were also flooded. A few trees were downed in the Manassas area. In Fairfax County, a 61 year old woman was killed when a tree fell onto her car and crushed it on Fair Lakes Drive. ONe business was destroyed by fallen trees and another in Falls Church was damaged. A 70 ft oak tree fell onto a home and tore a hole in the 2nd floor, shattering windows and tearing off rain gutters. The tree also damaged a detached garage and a swingset. The Mason Neck area saw several large trees downed, including a 100 ft poplar that put a hole through a bedroom of a two story home. Mt. Vernon and Vienna also reported several downed trees, including one which damaged a car. The county had to hire 16 tree trimming contractors to clear downed trees that blocked roadways. Flooding caused problems at 7 major intersections and on 20 secondary roads. Winds and rain combined to topple 130 trees in Arlington County and Alexandria. One tree damaged a home and 4500 power outages were reported. In Loudoun County, a handful of trees were downed and a road was blocked near Mt. Weather. Siding was also torn off the side of a few homes. Clarke County reported downed trees and power outages along the ridge at the Loudoun County border. Trees were also downed on the top of Blue Mountain in the southern portion of the county, knocking out power and phone service. In Warren County, a few trees and power lines were downed at higher elevations. In Winchester, a home was damaged by a fallen tree and a few customers lost power.							
Augusta County									
Countywide	29	1900EST 2100EST			0	0		Heavy Rain	
		1.5 to 2.5 inches of rainfall in 2 hours							
Nelson County									
Countywide	29	1900EST 2245EST			0	0	40K	Flash Flood	
		20 roads closed by high water, mudslide near Colleen along Route 29							
Albemarle County									
Countywide	29	1945EST 2340EST			0	0		Flash Flood	
		Several roads and low water crossings flooded							
Greene County									
Countywide	29	1945EST 2340EST			0	0		Flash Flood	
		20 roads closed by high water, motorist rescued on Route 605, up to 8 inches of rain in Gladstone area							
Madison County									
Countywide	29	1945EST 2340EST			0	0		Flash Flood	
		Route 600 and 638 closed by high water, 6 inches of rain in Syria, streams near Old Rag Mountain out of their banks							
Page County									
Countywide	29	1945EST 2340EST			0	0		Flash Flood	
		Roads and low water crossings flooded							

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, North</u>									
Culpeper County									
Culpeper to	29	2000EST			0	0			Heavy Rain
Countywide		2300EST							
		Nearly 4 inches of rainfall in 3 hours							
Orange County									
Countywide	29	2000EST			0	0			Heavy Rain
		2300EST							
		2 to 3 inches of rainfall in 3 hours							
Clarke County									
Countywide	29	2100EST			0	0			Flash Flood
		2345EST							
		Bridges across Opekin Creek closed by high water, Route 604 and 723 washed out							
Warren County									
Countywide	29	2100EST			0	0			Flash Flood
		2345EST							
		Dismal Road and lindon area flooded							
Fauquier County									
Countywide	29	2130EST			0	0			Heavy Rain
		2330EST							
		Over 2 inches of rain in 2 hours							
Rappahannock County									
Countywide	29	2145EST			0	0			Flash Flood
		2359EST							
		Hazel River out of its banks, Route 522 closed by high water							
Fairfax County									
Countywide	29	2200EST			0	0			Heavy Rain
		2359EST							
		Rainfall up to 3 inches in 3 hours							
Manassas (C)									
Manassas	29	2200EST			0	0			Heavy Rain
		2359EST							
		Several streets flooded							
Rockingham County									
Bridgewater to	29	2200EST			0	0	8K		Thunderstorm Wind
Elkton		2215EST							
		Power lines downed							
Frederick County									
Hayfield	29	2210EST			0	0			Thunderstorm Wind (G52)
		60 MPH wind gust, store roof damaged							
Frederick County									
North Portion	29	2210EST			0	0	5K		Thunderstorm Wind
		2220EST							
		Trees downed, metal canopy damaged along Route 50 east of Winchester							
Clarke County									
Countywide	29	2220EST			0	0	10K		Thunderstorm Wind
		2240EST							
		25 roads blocked by downed trees, 1 acre of trees flattened on Blue Ridge Mountain							
Greene County									
Countywide	29	2220EST			0	0	2K		Thunderstorm Wind
		2230EST							
		Trees and power lines downed							
Winchester (C)									
Winchester	29	2223EST			0	0	3K		Thunderstorm Wind
		Trees snapped and downed, 1 lane of Interstate 81 South blocked between Route 7 and Route 50							
Warren County									
5 NE Front Royal	29	2230EST			0	0	0.50K		Thunderstorm Wind
		Tree downed across Morgan's Ford Road (Route 624)							
Loudoun County									
Countywide	29	2250EST			0	0	10K		Thunderstorm Wind
		2310EST							
		Numerous trees downed							

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

VIRGINIA, North

Fairfax County Countywide

29 2310EST
2330EST 0 0 10K Thunderstorm Wind

Trees downed in Herndon, Fair Lakes, and Springfield; tree on home in Chantilly

Manassas (C) Manassas

29 2315EST 0 0 2K Thunderstorm Wind

Trees downed

Fairfax (C) Fairfax

29 2340EST 0 0 2K Thunderstorm Wind

Trees downed

Falls Church (C) Falls Church

29 2340EST 0 0 2K Thunderstorm Wind

Trees downed

Alexandria (C) Alexandria

29 2350EST 0 0 2K Thunderstorm Wind

Trees downed

Arlington County Countywide

29 2350EST 0 0 2K Thunderstorm Wind

Trees downed

An area of intense showers moved across Northern Virginia from 7:00 PM on the 29th through 1:00 AM EDT on the 30th, producing winds in excess of 55 MPH and very heavy downpours. Flash flooding was reported in several counties, and high winds knocked numerous trees and power lines down. Rainfall totals from Nelson County included 5.52 inches at Lovingson, 4.87 inches at Devils Knob, 3.68 inches at Tye River, 3.22 inches at Afton Mountain, and 2.01 inches at Montebello. A mudslide closed Route 29 at Colleen. Routes 641, 634, 617, 722, 662, and 605 (River Road) were closed due to high water. Up to 20 roads were closed at one time across the county overnight, and schools were closed on the 30th because several roads were still impassable by morning. One family had to be evacuated from their home became surrounded by water and several homeowners reported flooded basements. Damages countywide were estimated around \$50,000. Albemarle County reported parts of Route 776, 667, 250W, Sharon Road, and dozens of other roads under water. The community of Free Union reported 4.37 inches of rainfall. In Augusta County, rainfall amounts included Waynesboro at 2.72 inches, Robinson Hollow at 2.62 inches, and Upper Sherando at 2.44 inches. Strong winds knocked down power lines in Rockingham County, sending 4000 residents into the dark. Lines were downed across Route 981 near Elkton, on Route 33 and Judy Lane near McGaheysville and on Mt. Crawford Avenue in Bridgewater. Greene County reported more than 20 roads covered by high water. One woman was rescued from her vehicle after she unknowingly drove into a flooded portion of Route 604 (South River Road) around 9:45 PM EDT. Standardsville reported 2.98 inches of rainfall. Trees and power lines were also downed across the county, leading to scattered power outages. Page County reported 4.68 inches of rainfall at Lewis Mountain Camp, 4.28 inches at Big Meadows, 2.75 inches at Ida, 2.36 inches at Rocky Branch, and 2.09 inches at Luray. Several low lying bridges and Longs Road were water covered after the deluge.

In Madison County, Route 600 and 638 were closed at Criglersville by high water. Streams near Old Rag Mountain overflowed. Rainfall reports included Fork Mountain at 4.56 inches, Syria at 4.45 inches, Hood at 4.20 inches, Madison at 4.1 inches, Robinson at 3.51 inches, and 3.00 inches along Route 29 at the Rapidan River. In Orange County, Somerset reported 3.05 inches of rain, and the city of Orange reported 2.25 inches. The city of Culpeper in Culpeper County reported 3.92 inches of rainfall. Rainfall amounts in Rappahannock County included 4.48 inches at Sperryville, 3.90 inches at Castleton, and 3.65 inches at Massie's Corner. The Hazel River went out of its banks by 10:15 PM EDT. High water closed Route 522 between Huntly and Chester Gap and portions of Route 729, 628, 622, and 626. Schools were closed on the 30th because several roads remained under water overnight. In Warren County, 4.64 inches of rain fell at Chester Gap, 4.56 inches fell at Manassas Gap, 4.52 inches fell at Limeton, 3.43 inches fell at Hogback Mountain, and 2.16 inches fell at Browntown. Dismal Road and the Lindon area were flooded. High winds also downed a tree across Morgan's Ford Road (Route 624). Nearly 2.4 inches of rain fell at Warrenton in Fauquier County between 10:30 PM EDT on the 29th and 12:30 AM EDT on the 30th. The community of Opal received 2.37 inches and the The Plains recorded 2.40 inches. In Frederick County, winds gusted to 60 MPH at Hayfield. An old convenience store along Route 50 in the Hayfield area had sections of its roof ripped off and thrown into the parking lot. Trees and power lines were downed across the northern half of the county and the city of Winchester, resulting in power outages for 1400 customers. Fallen trees blocked 1 1/2 lanes of Interstate 81 southbound between Route 50 and Route 7. High winds blew a metal canopy off a building along Route 50 east of Winchester and brought trees down across the highway. Winds gusted to 47 MPH at the Winchester Airport at 11:23 PM EDT.

Clarke County reported wind damage and flooding. Trees and power lines were downed countywide blocking 25 roads, including Route 540, 955, and 1513. An acre of trees on Blue Ridge Mountain was flatten. Flash flood waters washed out a culvert on Route 723 and a bridge on Route 604. High water covered portions of Route 761 and 655 along Opequon Creek. Mt. Weather received 3.80 inches of rain. In Loudoun County, winds gusted to 53 MPH at Round Hill at 11:55 PM EDT and numerous trees were downed in the western portion of the county. Trees were also reported downed in Waterford, Lucketts, and Cascades. Rainfall amounts included Middleburg at 1.95 inches, Leesburg at 1.92 inches, Sterling at 1.69 inches, and Dulles International Airport at 1.56 inches. In the city of Manassas, several trees were downed and a quick 1.98 inches of rain flooded city streets. Liberia Avenue, Braddock Road, and Compton Road were temporarily covered with water. Water also covered Route 28 in southern Prince William County near the Fauquier County line. In Fairfax County, trees were downed in Herndon and the city of Fairfax. Other trees fell onto Interstate 66 at the Fairfax County Parkway and Interstate 95 at Route 644 in Springfield. Winds gusted to 54 MPH in Chantilly at

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Number of Persons Injured	Estimated Damage Property	Crops	Character of Storm
<u>VIRGINIA, North</u>									
and 50 MPH at Springfield. Rainfall amounts included Bull Run Mountain at 2.80 inches and Mt. Vernon at 1.6 inches. Washington Reagan National Airport received 1.59 inches and a wind gust of 45 MPH at 11:49 PM EDT. Scattered trees were downed in Falls Church, Alexandria, and Arlington. 3000 customers across Northern Virginia lost power as a direct result of the storm.									
Culpeper County Rapidan	30	0930EST 2359EST			0	0			Flood
Agricultural land flooded along Remington River near Rapidan									
Fauquier County Remington	30	0930EST 2359EST			0	0			Flood
2 feet of water from Rappahannock River invaded southern portion of Remington									
Heavy rains between 2 and 6 inches fell across the headwaters of the Rappahannock River basin on the 29th. This caused river levels to surge over flood stage on the Rapidan River near the community of Rapidan and on the Rappahannock River at Remington. The Rapidan River rose above the 14 feet flood stage around noon on the 30th and remained above 14.0 feet through 1:30 AM EDT on the 1st of October. The river crested at 17.51 feet around 7:30 PM EDT on the 30th. Agricultural lands near the community of Rapidan were flooded. The Rappahannock River rose above the 15.0 feet flood stage around 11:45 AM EDT on the 30th and remained above 15.0 feet through 8:15 AM EDT. The river crested at 19.14 feet around 10:30 PM EDT on the 30th. Between 2 and 3 feet of water flowed into the southern portion of Remington.									
<u>VIRGINIA, Northwest</u>									
VAZ003>004	Dickenson - Buchanan								
	01	0000EST			0	0			Drought
	30	2300EST							
The summer drought lingered during September, as the monthly rains amounted to only 1.5 to 2.75 inches.									
VAZ003	Dickenson								
	23	0700EST			0	0			Frost
The first significant frost occurred for areas away from the rivers. Outside of Clintwood, a 31 degree temperature was recorded.									
<u>VIRGINIA, Southwest</u>									
VAZ007-009>020-022>024-032>035-043>047-058>059	Tazewell - Smyth - Bland - Giles - Wythe - Pulaski - Montgomery - Grayson - Carroll - Floyd - Craig - Alleghany - Bath - Roanoke - Botetourt - Rockbridge - Patrick - Franklin - Bedford - Amherst - Henry - Pittsylvania - Campbell - Appomattox - Buckingham - Halifax - Charlotte								
	01	0000EST			0	0			Drought
	05	0100EST							
Dry conditions that began in July of 1998, subsided for several months during the later part of 1998 and the first part of 1999, returned in June of 1999 and continued in many areas through early September. In many areas, crops were damaged or destroyed. Water levels in creeks, streams, and rivers were very low. The drought ended in most areas with the arrival of heavy rain from the remnants of hurricane Dennis on the 4th and 5th of September.									
VAZ044-058	Pittsylvania - Halifax								
	04	2100EST			0	0	0		High Wind
	05	1100EST							
High winds from the remnants of Hurricane Dennis on the evening of the 4th and morning of the 5th, downed trees and powerlines.									
Bedford County 8.5 S Bedford City	05	0700EST 0900EST			0	0			Urban/Sml Stream Fld
Bedford County 10.5 S Bedford City	05	0700EST 0930EST			0	0			Urban/Sml Stream Fld
VAZ044	Pittsylvania								
	05	1035EST			0	0	0		High Wind
Heavy rain on the 5th caused street flooding at the intersection of Route 24 and Route 122, eight and a half miles south of the City of Bedford and flooded Goose Creek onto adjacent roads, 10.5 miles south of the City of Bedford.									
High winds downed a tree onto State Route 863, 10 miles north of Danville.									
Roanoke (C) Roanoke	05	0925EST 1000EST			0	0			Urban/Sml Stream Fld
Heavy rain in the City of Roanoke flooded Carter Street, and caused a small stream to flood onto Edgewood Street and Brandon Street.									
Halifax County Halifax	07	2215EST			0	0	0		Thunderstorm Wind

Storm Data and Unusual Weather Phenomena

September 1999									
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, Southwest</u>									
Halifax County									
Halifax	07	2250EST			0	0	0		Thunderstorm Wind
									Thunderstorms on the late evening of the 7th downed numerous trees in Halifax.
Charlotte County									
3 SW Madisonville	08	0945EST			0	0			Urban/Sml Stream Fld
									Heavy rain on the 8th caused Cub Creek to flood, 3 miles southwest of Madisonville.
Roanoke (C)									
Roanoke	09	0925EST 1025EST			0	0			Flash Flood
Floyd County									
2 E Pizarro	09	1330EST			0	0	0		Thunderstorm Wind
Patrick County									
Stuart	09	1439EST 1525EST			0	0			Flash Flood
Amherst County									
Amherst	09	1650EST 1800EST			0	0			Flash Flood
									Thunderstorms on the 9th produced damaging winds and flash flooding.
									Thunderstorm winds downed a tree onto County Route 888, two miles east of Pizarro.
									Heavy rain flooded roads in Amherst, Stuart, and the City of Roanoke.
Danville (C)									
Danville	15	0935EST 1400EST			0	0			Urban/Sml Stream Fld
									Heavy rain caused Sandy Creek in the City of Danville to flood onto surrounding streets.
VAZ043-058									
		Henry - Halifax							
	15	2300EST			1	1	25K		High Wind
	16	1600EST							
									High winds from the remnants of Hurricane Floyd on the evening of the 15th and the 16th, downed trees and powerlines. One tree was toppled onto a mobile home in Paces, killing a women and injuring a two week old infant. F22MH
Halifax County									
Red Bank	16	0700EST 1030EST			0	0			Flash Flood
Charlotte County									
3 S Wylliesburg	16	0710EST 1030EST			0	0			Flash Flood
									Heavy rain on the 16th caused flash flooding that closed Highway 92, 3 miles south of Wylliesburg, and Highway 602 in Red Bank.
VAZ058									
		Halifax							
	16	1430EST			0	0			Flood
	17	1930EST							
									Heavy rain on the 15th and 16th caused minor flooding of the Dan River at South Boston on the 16th and 17th.
Halifax County									
Southeast Portion	21	2045EST 2245EST			0	0			Urban/Sml Stream Fld
									Thunderstorms on the 21st produced heavy rain that caused flooding in southeastern Halifax County. Six roads were closed, including State Route 96.
Martinsville (C)									
Martinsville	27	1045EST 1245EST			0	0			Urban/Sml Stream Fld
									Heavy rain during the morning of the 27th, flooded and closed several streets in the City of Martinsville.
Pittsylvania County									
East Portion	28	1420EST			0	0			Flash Flood
	29	1200EST							
									Heavy rain on the 28th produced flash flooding, mainly in eastern sections of Pittsylvania County.
									Flash flooding closed parts of routes in the following locations: Route 683 from 6 miles southeast of Gretna to 8 miles southeast of Gretna, Route 938 from 5 miles east-southeast of Gretna to 7 miles east-southeast of Gretna, Route 713 from 2.5 miles northeast of Keeling to 5.5 miles northeast of Keeling, Route 912 from 5.5 miles east of Keeling to 5.5 miles east-southeast of Keeling, Route 895 from 6 miles east of Chatham to 8 miles east of Chatham, Route 683 from Mount Airy to 5 miles south-southwest of Mount Airy, and Route 694 5 miles south of Chatham.

Storm Data and Unusual Weather Phenomena

									September 1999
Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<u>VIRGINIA, Southwest</u>									
Appomattox County									
West Portion	29	1130EST			0	0			Flash Flood
	30	0200EST							
Pittsylvania County									
5 SE Chatham	29	1500EST			0	0			Flash Flood
		1900EST							
Carroll County									
11 SE Hillsville	29	1630EST			0	0	0		Thunderstorm Wind
Lynchburg (C)									
Lynchburg	29	1630EST			0	0			Flash Flood
		2300EST							
Amherst County									
Countywide	29	1700EST			0	0			Urban/Sml Stream Fld
	30	0230EST							
Patrick County									
2.5 S Ararat	29	1728EST			0	0	0		Thunderstorm Wind
Patrick County									
2 SSE Ararat to	29	1731EST	0.2	50	0	0	60K		Tornado (F1)
2.2 SSE Ararat		1732EST							
Patrick County									
2.5 SE Ararat to	29	1734EST	1	50	0	0	130K	10K	Tornado (F1)
2.5 ESE Ararat		1736EST							
Patrick County									
4 ENE Ararat to	29	1742EST			0	0	0		Thunderstorm Wind
4.5 ENE Ararat									
Campbell County									
West Portion	29	1915EST			0	0			Flash Flood
		2230EST							
Halifax County									
Halifax	29	2100EST			0	0	0		Thunderstorm Wind
Campbell County									
1 N Concord	29	2200EST			0	0			Flash Flood
	30	0000EST							
Pittsylvania County									
Gretna	29	2250EST			0	0			Flash Flood
	30	0200EST							
Buckingham County									
4 S New Canton	29	2315EST			0	0	15K		Thunderstorm Wind
Thunderstorms on the 29th produced damaging winds, flash flooding, and two tornadoes.									
Thunderstorm winds downed 10 trees at the intersection of State Route 653 and U.S Route 58, eleven miles southeast of Hillsville, downed several trees 2.5 miles south of Ararat, downed several trees and broke off large tree limbs from 4 miles east-northeast of Ararat to 4.5 miles east-northeast of Ararat, downed large trees in Halifax, including a tree that closed Route 501 southbound for two hours, and downed trees and damaged a mobile home 4 miles south of New Canton.									
Heavy rain flooded Route 707, five miles southeast of Chatham, 6 creeks in western Campbell County, closing several roads, flooded and closed Route 460 one mile north of Concord, stranding a motorist, numerous small streams and roads in Amherst County, several roads in the City of Lynchburg, forcing them to be closed, flooded Mill Stream Bridge in Gretna, and several streams in western Appomattox County, closing several roads.									
A thunderstorm spawned two tornadoes in Patrick County, during the early evening of the 29th.									
The first tornado formed 2.2 miles south-southeast of Ararat at 1731 EST. It was on the ground for about a quarter of a mile before dissipating at near 1732 EST. The path was 50 yards wide. This tornado tore off part of the roof of a tobacco curing shelter, uprooted several trees, and broke off large tree limbs. One large tree fell on and destroyed a mobile home. Maximum wind speeds were estimated at about 80 miles an hour.									
The second tornado formed 2.5 miles southeast of Ararat at 1734 EST, and travelled northeast for nearly a mile, to 2.5 miles east-southeast of Ararat before dissipating at 1736. This tornado damaged the roof of a house, tore shingles and a gutter off of a church, damaged out buildings and a barn, uprooted several trees, broke off large tree limbs, and damaged some tobacco crops. This tornado was 50 yards wide and maximum winds were also estimated at about 80 miles an hour.									
Buckingham County									
2 NW Buckingham	30	0015EST			0	0			Urban/Sml Stream Fld
Heavy rain on the 30th caused the North River to flood, 2 miles northwest of Buckingham.									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

VIRGINIA, Southwest

Pittsylvania County East Portion

**30 0100EST
0900EST** **0 0** **Flash Flood**

Heavy rain produced flash flooding on the early morning of the 30th, mainly in the east portion of Pittsylvania County.

Heavy rain flooded and closed parts of the routes in the following locations: Route 637 nine miles north-northeast of Gretna, Route 792 one mile east of Gretna, Route 683 from 1 mile south-southwest of Mount Airy to 5 miles south-southwest of Mount Airy, and Route 703 five miles southwest of Chatham.

VAZ047

Buckingham
**30 0230EST
2359EST** **0 0** **Flood**

Heavy rain on the 28th and 29th resulted in the flooding of the James River from the 30th of September into early October. Minor flooding occurred at Scottsville with moderate flooding at Brems Bluff.

VAZ058

Halifax
**30 0400EST
2359EST** **0 0** **Flood**

Heavy rain on the 28th and 29th resulted in minor flooding of the Dan River at South Boston on the 30th. Flooding continued into early October.

VAZ059

Charlotte
**30 0400EST
2359EST** **0 0** **Flood**

Heavy rain on the 28th and 29th caused minor flooding of the Roanoke River at Randolph. The flooding started on the 30th, and continued into early October.

WASHINGTON, Northeast

Stevens County Wellpinit

**25 0700PST
2300PST** **0 0** **Wild/Forest Fire**

A wildfire engulfed 3000 acres before being contained on the Spokane Indian Reservation. The strong winds during the day helped spread the fire.

WAZ031-033>037-041-044 **Northeast Blue Mountains - Washington Palouse - Moses Lake Area - Upper Columbia Basin - Spokane Area - Northeast Mountains - Wenatchee Area - Waterville Plateau**

**25 0700PST
1800PST** **0 0** **60K 40K** **High Wind**

Winds of 20 to 40 mph with gusts of 50-70 mph swept across much of Eastern Washington leading to numerous downed trees and power lines. There were many power outages and a few reports of small fires along with damage to vehicles. Apple orchards in the Wenatchee area suffered some damage as a small portion of their crop was blown to the ground.

WAZ034

Moses Lake Area
**25 1300PST
1330PST** **0 4** **60K** **Dust Storm**

Low visibilities due to a duststorm lead to a 4 car pile-up 6 miles south of Moses Lake, of which 4 persons received minor injuries. There was another accident due to the duststorm near Ritzville though no injuries were reported.

WASHINGTON, Northwest

NONE REPORTED.

WASHINGTON, Southeast

WAZ028 **Lower Columbia Basin**

25 0650PST **0 0** **High Wind (G59)**
Sustained winds of 68 mph gusting to 74 mph were recorded on Rattlesnake Ridge. (Elevation 3700 feet)

WAZ025 **East Slopes Southern Cascades**

25 0821PST **0 0** **High Wind (G74)**
A RAWs observing station at Sedge Ridge, located 15 miles west of Yakima, recorded a gust of 85 mph.

WAZ028 **Lower Columbia Basin**

25 1050PST **0 0** **High Wind (G48)**
A spotter located 12 miles north of the Tri-Cities estimated that winds of 45 to 55 mph reduced visibility to 20 ft.

WAZ029 **Blue Mountain Foothills**

25 1146PST **0 0** **6K** **High Wind**
Reduced visibilities caused several accidents with minor injuries on Highway 12 near Nine Mile hill, which is 6 miles east of the Columbia River and Wallula Junction. Widespread dust and high winds eventually led to the closing of this road.

WASHINGTON, Southwest

NONE REPORTED.

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

WASHINGTON, Southwest

WEST VIRGINIA, East

WVZ048>055

Grant - Mineral - Hampshire - Morgan - Berkeley - Jefferson - Pendleton - Hardy

01 0000EST

0

0

Drought

30 2359EST

Rainfall from two tropical storms and a handful of low pressure systems made an impact in the drought that plagued the region since the summer of 1998. By the end of the month, conditions across the Eastern Panhandle were upgraded from an extreme to a moderate drought because rainfall was above average during September. Rainfall totals included 7.9 inches in Jefferson County, 6.6 inches in Hardy County, 6.4 inches in Pendleton County, 6.0 inches in Hampshire County, 5.9 inches in Morgan County, 4.3 inches in Grant County, and 3.8 inches in Mineral County.

Effects of the drought still lingered in the agricultural community. Across the state by the end of the month, 81% of topsoil was reported short or very short of moisture. 32% of apples, 67% of corn, 69% of hay, 77% of pasture land, 30% of soybeans, and 33% of tobacco crops were in poor or very poor condition. By month's end, 28% of farmers were still hauling water for livestock, and 25% of wells were dry or had an extremely low water reserve.

**Grant County
Countywide**

05

0200EST

0

0

Flash Flood

0800EST

Tropical rains up to 4 inches

**Hampshire County
Countywide**

05

0200EST

0

0

Heavy Rain

0800EST

**Hardy County
Countywide**

05

0200EST

0

0

Heavy Rain

0800EST

**Pendleton County
Countywide**

05

0200EST

0

0

Flash Flood

0800EST

Tropical rains up to 5 inches

The remnants of Hurricane Dennis moved across the Eastern Panhandle from the afternoon of the 4th through early on the 6th. Heavy rain fell across Hampshire, Hardy, Grant, and Pendleton Counties. The heaviest downpours occurred between 3:00 AM and 9:00 AM EDT on the 5th, when portions of Grant and Pendleton Counties received up to 5 inches. Storm total rainfall across Pendleton County included 7.32 inches at Sugar Grove, 5.52 inches at Shenandoah Mountain, 5.04 inches at Cow Knob, 4.60 inches at Franklin, and 3.79 inches at Spruce Knob. In Grant County, 5.63 inches fell at Red Creek, 4.53 inches fell at Mt. Storm, 3.60 inches fell at Pigeon Roost, 3.40 inches fell at Cave Mountain, 3.01 inches fell at Bayard, and 2.67 inches fell at Knobly. In Hardy County, rainfall totals included 3.67 inches at Wardensville, 3.03 inches at Mathias, 2.68 inches at Moorefield, 2.36 inches at South Branch Mountain, and 2.32 inches at Bald Knob. Romney in Hampshire County reported a total of 3.12 inches and Slate Lick Knob reported 1.80 inches.

**Grant County
Mt Storm to
Scherr**

29

2030EST

0

0

5K

Thunderstorm Wind

2050EST

Numerous trees and power lines downed

**Jefferson County
Charles Town**

29

2100EST

0

0

Heavy Rain

2300EST

Over 2 inches in 2 hours

**Hampshire County
High View**

29

2150EST

0

0

Thunderstorm Wind (G52)

60 MPH wind gusts, trees and power lines downed

**Jefferson County
Countywide**

29

2240EST

0

1

40K

Thunderstorm Wind

2300EST

Trees and power lines downed along Route 340 corridor from Charles Town to Harpers Ferry; moderate structural damage in Ranson. An area of intense showers moved across the Eastern Panhandle from 9:30 PM to midnight, producing winds in excess of 55 MPH and very heavy downpours. In Grant County, numerous trees and power lines were downed from Mt. Storm to Scheer. Winds gusted to 60 MPH at Highview in Hampshire County, knocking down trees and power lines. Jefferson County was hardest hit. In Ranson, wind gusts estimated at 70 MPH blew a flat roof off an apartment building in the Park and 14th Avenue area, showering debris on a nearby trailer park. One person in the trailer park sustained a leg injury, and 6 others were evacuated after their homes were moderately damaged. Many trees and power lines were downed across the city. The storms also toppled trees and power lines along the Route 340 corridor from Charles Town to Harpers Ferry. The KOA campground in Harpers Ferry was littered with oak and spruce trees snapped 10 feet above the base. Power outages were widespread across the eastern half of the county. A total of 2.17 inches of rain fell in Charles Town. Highview in Hampshire County and Red Creek in Grant County reported just over an inch of rainfall.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of Persons	Estimated Damage	Property	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)					

September 1999

WEST VIRGINIA, North

WVZ001>004-012-021>023-041 **Hancock - Brooke - Ohio - Marshall - Wetzel - Marion - Monongalia - Preston - Tucker**

01 0000EST 0 0 Drought
30 2359EST

The Palmer Drought Severity Index showed the extreme drought conditions continued across all of Northern West Virginia. Rainfall deficits over the past 60 days (from August 1 through September 30) generally ranged from 15% to 25% below normal, and for the past year ranged from 10% to 20% below normal. This represents an actual shortfall of between 2 and 6 inches of rain across the area.

Marshall County
Moundsville

07 1840EST 0 0 25K Thunderstorm Wind
2030EST

Torrential thunderstorm rains produced flash flooding across the Moundsville area. Several roads were closed and some minor residential flooding was reported. Runoff from the rains produced damage at the high school construction site.

WEST VIRGINIA, Southeast

WVZ042>045 **Mercer - Summers - Monroe - Greenbrier**

01 0000EST 0 0 Drought
05 0300EST

Dry conditions that began in July of 1998, subsided for several months during the later part of 1998 and the first part of 1999, returned in June of 1999 and continued in many areas through early September. In many areas, crops were damaged or destroyed. Water levels in creeks, streams, and rivers were very low. The drought ended in most areas with the arrival of heavy rain from the remnants of hurricane Dennis on the 5th of September.

Greenbrier County
White Sulphur Spgs

29 1730EST 0 0 0 Thunderstorm Wind
Thunderstorms produced damaging winds on the evening of the 29th, downing trees and powerlines in White Sulphur Springs.

WEST VIRGINIA, West

WVZ005>011-013>020-024>040-046>047 **Wayne - Cabell - Mason - Jackson - Wood - Pleasants - Tyler - Lincoln - Putnam - Kanawha - Roane - Wirt - Calhoun - Ritchie - Doddridge - Mingo - Logan - Boone - Clay - Braxton - Gilmer - Lewis - Harrison - Taylor - McDowell - Wyoming - Raleigh - Fayette - Nicholas - Webster - Upshur - Barbour - Pocahontas - Randolph**

01 0000EST 0 0 Drought
30 2300EST

The drought severity increased again for the western lowland counties, generally west of the Interstate 79 corridor. Less than an inch of rain fell in Huntington for the entire month, making it the 6th driest September on record for that city. A few more wells went dry. Meanwhile, the drought actually eased a bit in the mountainous counties, from Elkins to Beckley. Rains of 3 to 4 inches were common during the month in these mountain areas. Most of that rain fell on the 5-6th, from the remains of Hurricane Dennis and on the 29th from a cold front. The heavy rains from the remnants of Hurricane Floyd remained east of this region on the 16th.

WVZ046>047 **Pocahontas - Randolph**

22 0700EST 0 0 Frost

The first significant frost of the new season was seen in the normally colder valleys. Gladly observed 29 degrees, while Seneca State Forest and Elkins had 30 degrees.

WVZ046>047 **Pocahontas - Randolph**

23 0700EST 0 0 Frost

Frost was seen for the second consecutive dawn. Gladly again reached 29 degrees with Marlinton at 30 degrees, while Dailey had 32 degrees.

WVZ031>032-039>040-047 **Harrison - Taylor - Upshur - Barbour - Randolph**

29 1915EST 0 0 Wind
2030EST

Wind gusts of 35 to 45 mph occurred along and behind a strong cold front. The wind gusted to 45 mph at 1932E at the airport near Clarksburg. At the Elkins airport, the wind gust was 43 mph at 2011E. A tree fell on a car along Taylor Ave. in Elkins. Power outages occurred to about 2,500 customers.

WISCONSIN, Extreme Southwest

NONE REPORTED.

WISCONSIN, Northeast

Door County
5 W Sturgeon Bay 09 1045CST 0 0 Funnel Cloud

Door County
3 N Sister Bay 09 1455CST 0 0 Waterspout

Door County
5 E Sturgeon Bay 09 1518CST 0 0 Funnel Cloud

Showers developed as cold air aloft caused the atmosphere to become more unstable. Funnel clouds were sighted over the Bay of

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

WISCONSIN, Northeast

Green Bay and the nearshore waters of Lake Michigan. One of the funnels briefly touched the water north of Sister Bay (Door county).

Waupaca County									
Manawa	19	1325CST			0	0			Thunderstorm Wind (G50)
Manitowoc County									
Whitelaw	19	1545CST			0	0			Hail (1.00)
Door County									
8 SE Sturgeon Bay	19	1646CST			0	0			Waterspout
		1710CST							

Isolated severe thunderstorms developed in advance of a cold front that moved through northeast Wisconsin during the late afternoon and early evening hours. Thunderstorms downed several trees in Manawa (Waupaca county) and large hail damaged vehicles in Whitelaw (Manitowoc county).

The crew of a ship off the Door county shoreline spotted several waterspouts at one time.

WISCONSIN, Northwest

Douglas County									
Superior	07	1700CST			0	0	0.50K		Lightning

Lightning struck the steeple of a church, causing a small amount of damage.

WISCONSIN, Southeast

Sheboygan County									
4 NW Plymouth	19	1603CST			0	0	25K		Lightning
Rock County									
4 NE Milton	19	1620CST			0	0			Hail (1.00)
Jefferson County									
Farmington	19	1630CST			0	0	2K		Thunderstorm Wind

Scattered thunderstorms, some with powerful winds and large hail, pushed through southcentral and southeast Wisconsin. Large trees and some power poles were pushed over in Farmington (Jefferson Co.). Lightning struck the roof of a home northwest of the village of Plymouth, resulting in a fire that heavily damaged the roof and upper story of the home.

WISCONSIN, Southwest

NONE REPORTED.

WISCONSIN, West

Barron County									
Barron	07	1320CST			0	0			Hail (1.75)
Rusk County									
2 N Hawkins	07	1430CST			0	0			Hail (0.75)
Rusk County									
5 N Glen Flora	07	1605CST			0	0			Hail (0.75)

WYOMING, Central and West

Sweetwater County									
18 NW Green River	02	1244MST			0	0			Funnel Cloud
Fremont County									
12 N Shoshoni	02	2100MST			0	0			Heavy Rain
	03	1200MST							
Heavy rain caused rock and mud slides across U.S. Highway 20 and the BNSF tracks between Shoshoni and Thermopolis.									
Fremont County									
15 S Lander	10	1200MST			0	0			Wild/Forest Fire
	11	1900MST							
Lightning-caused fire burned 600 acres of juniper and sagebrush.									
WYZ006									
Teton/Moutains									
25	0900MST				0	0			High Wind (G65)
	2300MST								
High winds in the Teton Wilderness downed many trees. A horse was killed by a falling tree. Wind speeds are estimates.									
WYZ011>012									
Wind River Mtns East - Lander Foothills									
27	2000MST				0	0			Heavy Snow
28	0300MST								
Up to a foot of snow in the Sinks Canyon area, 7 inches in Lander.									

Storm Data and Unusual Weather Phenomena

September 1999

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

WYOMING, Extreme Southwest

NONE REPORTED.

WYOMING, North Central

NONE REPORTED.

WYOMING, Northeast

NONE REPORTED.

WYOMING, Southeast

Platte County 15 NE Chugwater	01	1315MST 1319MST			0	0	6K		Hail (1.50)
		1 1/2 inch hail damaged a roof and broke a window							
Goshen County 12 W Veteran	01	1348MST 1350MST			0	0			Hail (1.75)
Goshen County 3 N Hawk Spgs	01	1350MST 1353MST	0.1	30	0	0			Tornado (F0)
		Brief tornado reported by spotter							
Goshen County 3 W Veteran	01	1355MST 1357MST			0	0			Thunderstorm Wind (G61)
		70 MPH wind gust.							
Goshen County 5 SE Hawk Spgs	01	1359MST 1403MST	0.2	25	0	0			Tornado (F0)
		Brief tornado reported by public							
Goshen County 10 W Lingle	01	1410MST 1414MST			0	0			Hail (1.75)
Goshen County 5 NE Hawk Spgs	01	1425MST 1426MST			0	0			Thunderstorm Wind (G53)
		61 mph wind gust recorded							
Laramie County 30 N Cheyenne	03	1548MST 1552MST			0	0			Thunderstorm Wind (G50)
		Wind gusts to near 60 MPH.							
Converse County 8 NW Glenrock	03	1551MST 1557MST	0.2	35	0	0			Tornado (F0)
		2 Tornadoes reported by officer 5 miles northwest of Rolling Hills, WY							
Platte County 2 S Wheatland	03	1559MST 1603MST			0	0			Hail (0.75)
Platte County Wheatland	03	1600MST 1604MST			0	0			Hail (0.75)
Platte County 5 N Slater	03	1614MST 1618MST			0	0			Hail (0.75)
Laramie County 3 W Carpenter	03	1630MST 1635MST			0	0	1K		Hail (0.75)
		3/4 inch hail damaged some corn and sugar beet crops.							
Goshen County 11 W Jay Em	03	1635MST 1639MST			0	0			Hail (0.75)

Storm Data and Unusual Weather Phenomena

		Time	Path	Path	Number of		Estimated	September 1999	
Location	Date	Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	Character of Storm
<u>WYOMING, Southeast</u>									
Goshen County									
Yoder	03	1645MST			0	0			Hail (1.00)
		1650MST							
Goshen County									
Lingle	03	1645MST			0	0			Hail (1.00)
		1649MST							
WYZ061-063-065-067			Southwest Carbon - Snowy Range - Laramie Valley - Platte						
25		0845MST			0	1	10K		High Wind (G61)
		1800MST							
High winds blew across parts of south central and southeast Wyoming. Wind gusts to 70 mph were reported at Arlington, WY, with gusts to 64 mph reported at the University of Wyoming in Laramie, and on Interstate 25 10 miles southeast of Wheatland, Wy. A tractor-trailer truck was blown over on Interstate 80 9 miles east of Arlington, injuring the driver.									
WYZ061-063-066			Southwest Carbon - Snowy Range - Laramie Range						
28		0600MST			1	1			Winter Storm
		1100MST							
Snow fell over parts of south central and southeast Wyoming, with snowfall of 8 inches reported at Elk Mountain, and 6 inches at Buford. Icy bridges resulted in an accident on Interstate 80 15 miles east of Rawlins, WY, which killed one person and injured another. F68VE									

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

January 1999

ADDITIONS/CORRECTIONS

TENNESSEE, Central

Benton County

3.3 W Camden to 2.6 S Faxon **22** **0320CST** **15** **220** **1** **5** **1M** **Tornado (F3)**
0335CST

This tornado resulted in the only fatality in Middle Tennessee from the severe weather outbreak of January 22, 1999. The tornado killed a 50 year old woman who left her shelter in a double wide modular home located on Cedar Grove Road. She went outside to get her dogs inside her home, and that's when the tornado struck and killed her. Her husband remained inside the home and survived. There were 5 injuries from the tornado. A 1600 square foot frame home was moved 10 to 12 feet from its foundation. 12 homes were destroyed, 33 homes sustained damage and 5 businesses were damaged. Power lines and trees were blown down. The winds picked up a 7500 pound Cadillac, and hurled its engine 300-400 yards into a field. The chassis, its empty metal skin, was hurled even further. F500U

Montgomery County

Clarksville to 4.3 NE Clarksville **22** **0415CST** **4.3** **880** **0** **5** **72.7M** **Tornado (F3)**
0420CST

An F3 tornado struck Clarksville at 415 AM, travelled through the downtown area and dissipated near St. Bethlehem. There were 5 injuries, 2 of them were for broken bones. Clarksville has a population of 89,000 people is Tennessee's fifth largest city. 25,000 people were without power. The Tornado Warning was issued by the NWS at 354 AM CST. The NOAA Weather Radio alerted the sleepy residents of Clarksville and urge them to take cover immediately. The tornado ripped apart a 5 block area of downtown Clarksville and teared up buildings in Austin Peay State University. Once the tornado ravaged the city, downtown Clarksville resembled bombed-out London during World War 2. Bricks and glass were strewn everywhere. The photo editor of the Leaf-Chronicle newspaper s, Fred Dye, said "It looked like somebody walked through with a broom and knocked over whatever was loose enough to knock down." The Montgomery county court house was in ruins. The City Fathers planned on rebuilding the court house. It was last rebuilt after a fire in 1878. The Leaf-Chronicle newspaper office was severely damaged. The newspaper had to set up a temporary office in Hopkinsville, KY. 22 buildings were heavily damaged at Austin Peay State University. Also, several old churches were heavily damaged in Clarksville. The Madison Street United Methodist Church lost its spires and roof. It will take about 2 years to rebuild the church. The Trinity Episcopal Church lost its roof. Police closed off downtown Clarksville from 6 PM-6 AM in order to prevent looting. The National Guard was on duty as well. On January 23, FEMA Director James Lee Whitt toured the devastation. He exclaimed, "Wow!" "It's like someone dropped a bomb on it. That's just what it look like." There was a total of 124 buildings destroyed and 562 buildings damaged. These figures included residential, commercial, government, public and buildings at Austin Peay.

Humphreys County

Gorman to Mc Ewen **22** **0443CST** **4** **220** **0** **1** **500K** **Tornado (F2)**
0449CST

Downed trees were reported from Gorman to McEwen. The hardest hit area was McEwen with 4 homes totally destroyed, 8 homes having severe damage, and 38 homes receiving minor damage. 8 to 10 outbuildings were destroyed and 60 trees were lost. 8 cars or trucks were damaged or destroyed. A man suffered a broken neck in his trailer.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	

April 1999

ADDITIONS/CORRECTIONS

NEBRASKA, West

Banner County

11 NW Harrisburg	09	1505MST 1506MST			0	0			Hail (0.75)
------------------	----	--------------------	--	--	---	---	--	--	-------------

TENNESSEE, Central

Robertson County

5 E Springfield	19	2110CST			0	0	5K		Hail (1.00)
-----------------	----	---------	--	--	---	---	----	--	-------------

A lady reported hail the size of quarters which damaged her roof. Also, strong thunderstorm winds damaged her gutters. Her home was located at 6232 Highway 76.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated		May 1999
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Property	Crops	
Character of Storm									

ADDITIONS/CORRECTIONS

OKLAHOMA, Western, Central and Southeast

Oklahoma County

Del City

03

1800CST

0

0

Hail (2.75)

Hail was reported near the intersection of Reno and Sooner, but is believed to have fallen mostly west of Sooner. This report was originally listed as Oklahoma City.

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

August 1999

ADDITIONS/CORRECTIONS

COLORADO, Central and Northeast

Phillips County									
6 S Holyoke	10	1350MST			0	0			Hail (1.00)
Logan County									
2 S Merino	10	1435MST			0	0			Hail (1.00)
Logan County									
28 SE Sterling	10	1458MST			0	0			Hail (0.75)
Weld County									
6 S Ft Lupton	10	1540MST			0	0			Thunderstorm Wind (G70)
Weld County									
.5 SW Ft Lupton to 4.5 NE Ft Lupton	10	1545MST 1600MST	5	50	0	0			Tornado (F1)
See narrative below.									
Weld County									
Platteville	10	1555MST	0.1	25	0	0			Tornado (F1)
See the narrative below.									
Morgan County									
3 S Wiggins	10	1628MST			0	0			Thunderstorm Wind (G58)
Morgan County									
Ft Morgan	10	1708MST			0	0			Thunderstorm Wind (G56)
Phillips County									
12 SE Haxtun	10	1830MST 2045MST			0	0			Flash Flood

Thunderstorms producing tornadoes, damaging straight-line winds, heavy rain and hail hammered portions of the Urban Corridor and Northeast Plains. In Denver, heavy rain and small hail, up to 2.5 inches in an hour, caused a 20-ft by 50-ft section of roof to collapse at a furniture warehouse. Damage to the warehouse was estimated at \$1.0 million. Heavy rain also flooded several underpasses with up to 3 feet of water, which resulted in a number of stalled vehicles.

Damaging straight-line winds along with several tornadoes were reported across Weld and Morgan Counties. In Fort Lupton, officials believed a tornado bounced from southwest to northeast across the area. Spotty damage was reported along a 5-mile path as trees, power poles and lines were downed. In addition, an empty semi-trailer was overturned onto another vehicle northeast of town. Another tornado touched down briefly in Platteville where a tree fell onto a house. Strong thunderstorm winds also blew a pickup truck off of Interstate 76 near Fort Morgan.

Heavy rain and large hail caused flooding and flash flooding problems in parts of Logan and Phillips Counties. Storm totals ranged from 3 to 6 inches southeast of Haxtun, near the Yuma county line. Several county roads were washed out with widespread field flooding reported. Heavy rain and hail also stripped corn and sunflower crops in the area.

MARYLAND, South

Dorchester County									
Hoopersville to Wingate	25	1630EST			0	0	5K		Waterspout

Waterspout from the Chesapeake Bay moved onshore and caused roof and siding damage to houses. Also, a wooden chair was carried about one-half mile and a gazebo was picked up.

NORTH DAKOTA, Central and West

La Moure County									
8 ENE Marion to 13 N Verona	15	1958CST 2013CST	8	400	0	0			Tornado (F2)

The storm survey was completed by NWS Grand Forks. The tornado started in Barnes county 1.5 miles southwest of Litchville, moved across far northeast LaMoure county, and dissipated in Ransom county 6 miles north of Lisbon. The total path length was 20 miles.

NORTH DAKOTA, East

Walsh County									
11 NE Grafton	15	1010CST			0	0			Hail (0.75)
Pembina County									
Drayton	15	1013CST			0	0			Hail (0.75)
Walsh County									
7 SW Edinburg	15	1105CST			0	0			Hail (0.75)
Walsh County									
6 SW Lankin	15	1200CST			0	0			Hail (0.75)

Storm Data and Unusual Weather Phenomena

Location	Date	Time	Path	Path	Number of		Estimated	Crops	Character of Storm
		Local/ Standard	Length (Miles)	Width (Yards)	Killed	Injured	Damage		

August 1999

ADDITIONS/CORRECTIONS

NORTH DAKOTA, East

Eddy County

New Rockford	15	1930CST			0	0	20K	Thunderstorm Wind
---------------------	-----------	----------------	--	--	----------	----------	------------	--------------------------

Large trees were downed around New Rockford, some falling on power lines. One tree fell on a house, damaging the roof. Several signs were also damaged.

Barnes County

7 W Litchville	15	1955CST	0.5	25	0	0		Tornado (F0)
-----------------------	-----------	----------------	------------	-----------	----------	----------	--	---------------------

The tornado briefly touched down in a field.

Barnes County

1.5 SW Litchville to 1 S Litchville	15	1957CST 1958CST	0.5	50	0	0	5K	Tornado (F1)
--	-----------	----------------------------	------------	-----------	----------	----------	-----------	---------------------

The tornado began south and west of Litchville, travelling mostly through open country before it crossed briefly into Lamoure county. It then crossed into Ransom county, where it dissipated north of Lisbon.

Barnes County

1 N Litchville	15	2000CST			0	0		Hail (2.75)
-----------------------	-----------	----------------	--	--	----------	----------	--	--------------------

Barnes County

Litchville	15	2003CST			0	0		Hail (0.75)
-------------------	-----------	----------------	--	--	----------	----------	--	--------------------

Barnes County

Hastings	15	2012CST	0.5	25	0	0		Tornado (F0)
-----------------	-----------	----------------	------------	-----------	----------	----------	--	---------------------

The tornado briefly touched down.

Ransom County

5 NW Ft Ransom to 6 N Lisbon	15	2013CST 2040CST	20	400	0	0	1.2M	Tornado (F2)
---	-----------	----------------------------	-----------	------------	----------	----------	-------------	---------------------

Most of the damage from the tornado occurred roughly 3 miles northeast of Fort Ransom, just across the Sheyenne River. One farm had a wood barn and 2 large pole barns completely destroyed. At another nearby farm, another wood barn and a pole barn were destroyed, some debris deposited several hundred feet away. Numerous large trees were broken and a feeding car was thrown a half a mile away. Thousands of large trees surrounding the path of the tornado were snapped in two, many of these along the Sheyenne River Valley.

PACIFIC

Guam

Countywide to Dededo	05	1100SST 1500SST			0	0		Urban/Sml Stream Fld
---------------------------------	-----------	----------------------------	--	--	----------	----------	--	-----------------------------

Light winds allowed a sea breeze to develop over Guam. Daytime heating combined with wind convergence from the sea breeze to produce showers and thunderstorms across the island. Nexrad weather radar showed a one-hour rainfall rate of two and a half inches of rain near Dededo and a one-hour rainfall rate of one and a half inches of rain near Agat.

Guam

Central Portion	05	1555SST 1610SST			0	0		Funnel Cloud
------------------------	-----------	----------------------------	--	--	----------	----------	--	---------------------

Funnel cloud observed to the east of the National Weather Service Office at Tiyan.

Guam

Central Portion	08 09	2300SST 0000SST			0	0		Urban/Sml Stream Fld
------------------------	------------------	----------------------------	--	--	----------	----------	--	-----------------------------

Showers and thunderstorms brought 1.04 inches of rain to the National Weather Service Office at Tiyan between 2300 on August 8th and midnight on the 9th. Favorable upper level winds enhanced shower and thunderstorm activity across the Marianas Islands.

Guam

Countywide	28	1040SST 1630SST			0	0		Urban/Sml Stream Fld
-------------------	-----------	----------------------------	--	--	----------	----------	--	-----------------------------

Daytime heating combined with favorable upper level winds produced showers and thunderstorms across the island of Guam. Winds were light so the movement of showers was slow which resulted in localized flooding. Rainfall recorded at the National Weather Service Office at Tiyan between 1000 and 1600 was 1.09 inches with an additional 0.62 of an inch falling between 1600 and 1900.

Reference Notes:

Fatality Location Abbreviations:

BF	Ball Field	MH	Mobile Home
BO	Boating	OT	Other
BU	Business	OU	Outside/Open Areas
CA	Camping	PH	Permanent Home
EQ	Heavy Equipment/Construction	SC	School
GF	Golfing	TE	Telephone
IW	In Water	UT	Under Tree
LS	Long Span Roof	VE	Vehicle

List of Acronyms:

WCM	- Warning Coordination Meteorologist
NWS	- National Weather Service
NOAA	- National Oceanic and Atmospheric Administration
DST	- Daylight Savings Time
LST	- Local Standard Time
LDT	- Local Daylight Time

Other Notes:

When listing wind speed values under “Character of Storm”, ex. High Wind (G81), the “G” indicates a “*Gust*” which is a peak 5-second averaged wind speed in Knots (kts). 1 kt. = 1.152 mph.

When listing hail size under “Character of Storm”, ex. Hail (2.25), the hail size is given in inches and hundredths of inches.

When listing property and crop damage, the figures indicated are the best guess made by the NWS from the available sources of information at the time of the printing.

The Saffir-Simpson Scale

Category One Hurricane:

Winds 74-95 mph (64-82 kt or 119-153 kph). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.

Category Two Hurricane:

Winds 96-110 mph (83-95 kt or 154-177 kph). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.

Category Three Hurricane:

Winds 111-130 mph (96-113 kt or 178-209 kph). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane center. Flooding near the coast destroys smaller structures with larger structures damaged by battering of floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.

Category Four Hurricane:

Winds 131-155 mph (114-135 kt or 210-249 kph). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the hurricane center. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).

Category Five Hurricane:

Winds greater than 155 mph (135 kt or 249 kph). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane center. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

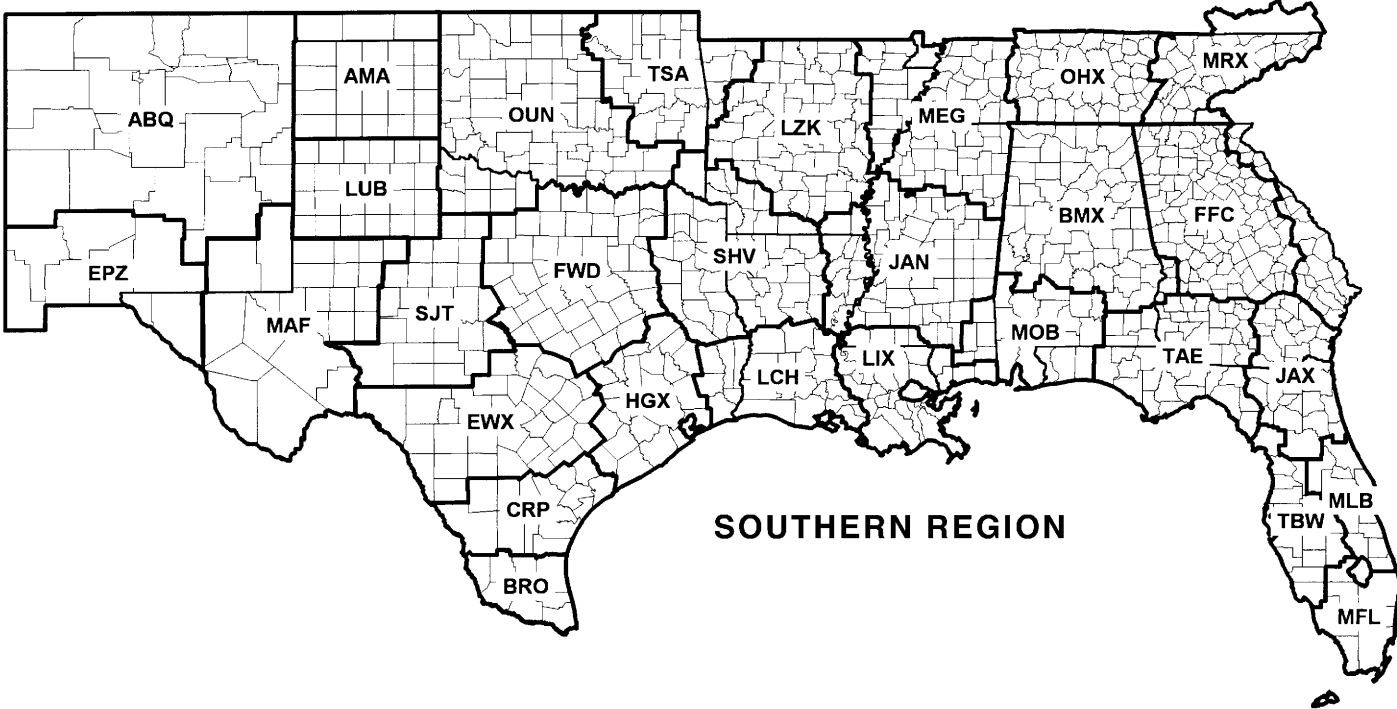
The Fujita Scale

F-Scale	Intensity	Wind Speed (mph)	Typical Damage
F0	Gale Tornado	40 - 72	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate	73 - 112	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant	113 - 157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe	158 - 206	Roof and some walls torn off well constructed houses; trains overturned; most trees in fores uprooted
F4	Devastating	207 - 260	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible	261 - 318	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-inforced concrete structures badly damaged.
F6	Inconceivable	319 - 379	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds.

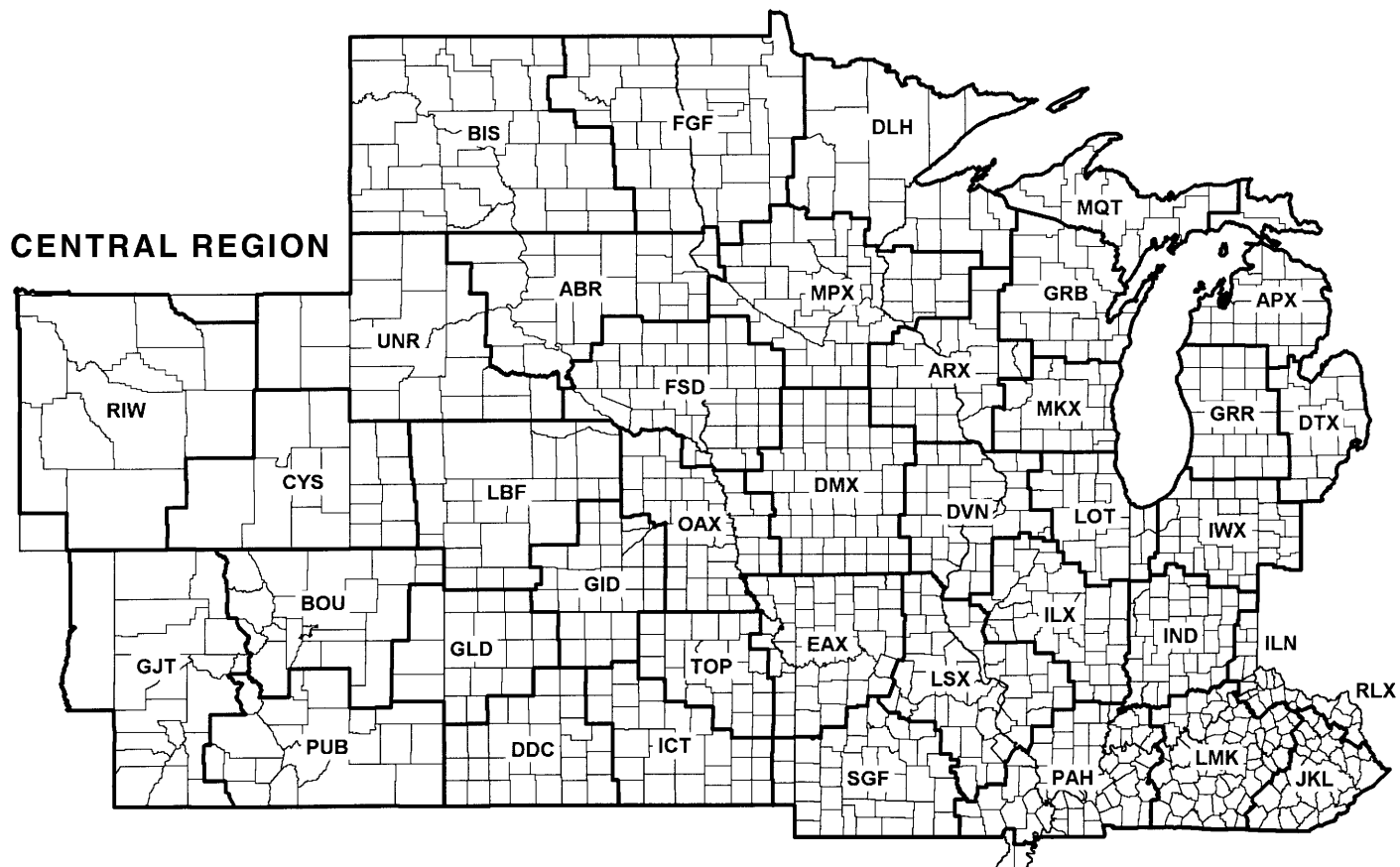
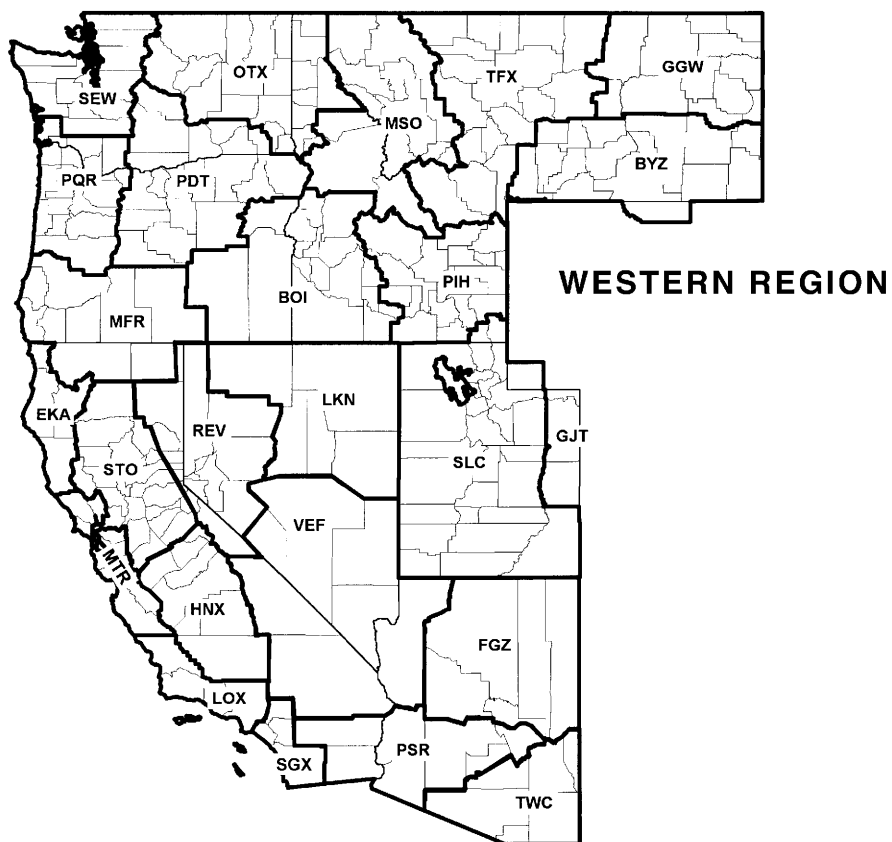


* From the Journal of Atmospheric Science, August 1981, p. 1517-1519

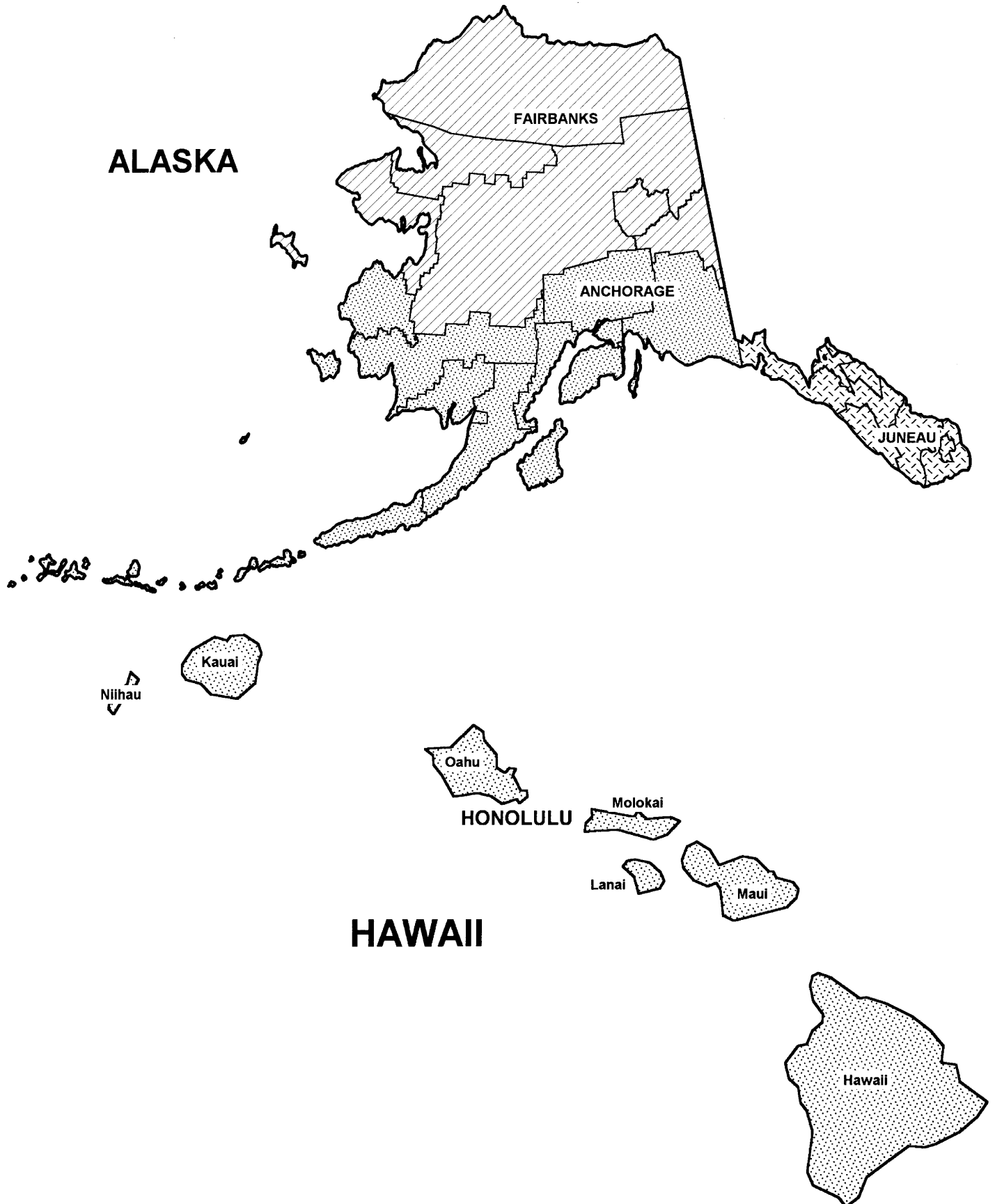
COUNTY WARNING & FORECAST AREAS - MODERNIZED NWS



COUNTY WARNING & FORECAST AREAS - MODERNIZED NWS



MODERNIZED COUNTY WARNING AREAS



To change your address, please return a copy of the mailing label with your new address to: National Climatic Data Center (Subscription Services).

*Inquiries/Comments Call: (828) 271-4800 (Voice)
(828) 271-4010 (TDD)
(828) 271-4876 (Fax)*

National Climatic Data Center
Room 120
151 Patton Avenue
Asheville, NC 28801-5001

**OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300
ADDRESS CORRECTION REQUESTED**

<p>BULK RATE POSTAGE & FEES PAID United States Department of Commerce NOAA Permit No. G - 19</p>

BOUND PRINTED MATTER